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ABSTRACT

Twenty students in an Experience-Based Career Education program were randomly selected for two periods of observation (Fall and Spring) at two kinds of sites (work-experience and school). Observations were coded, and then compiled and analyzed by computer. Results indicated a surprising similarity between activities of the resource (work-experience) sites and at the school. Three types of behavioral change were observed: (1) changes in the subject matter areas in which students engaged; (2) modifications in instructional procedures including declines in the use of textbooks, increases in the use of workbooks, increases in student involvement in instructional groups, increases in writing activity, and decreases in the assignment of new tasks for students; and, most importantly, (3) changes in student behavior which were suggestive of increasing student maturation--increases in acceptance of responsibility and in displays of initiative. A list of student outcome objectives is appended, as well as the lexicon of code words used in recording observations of student behavior. The objectives involve career development--self-development, career decision making and planning; basic skills--oral communications, writing, reading, and basic mathematics; and life skills--interpersonal, problem solving, decision making, and inquiry. Elective life skills objectives include media skills, physical fitness, sociocultural awareness, and political awareness. (Author/CTM)

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BEHAVIORAL OBSERVATIONS AT FAR WEST SCHOOL: A DESCRIPTION OF EXPERIENCE-BASED CAREER EDUCATION

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EXPERIENCE-BASED CAREER EDUCATION PROGRAMS

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EXTERNAL EVALUATOR'S FINAL REPORTS ON THE EXPERIENCE-BASED CAREER EDUCATION PROGRAM

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Volume II	Experience-Based Career Education in Charleston, West Virginia: An Anthropological Perspective
Volume III	Experience-Based Career Education in Oakland, California: An Anthropological Perspective
Volume IV	The Academy for Career Education: An Ethnographic Evaluation
Volume V	An Ethnographic Account of $(CE)_2$: Experience-Based Career Education in Tigard, Oregon
Volume VI	Student Outcomes and Participant Opinions in Experience-Based Career Education Schools
Volume VII	Search for and Development of Instruments Measuring Student Outcomes of Experience-Based Career Education Programs
Volume VIII	Behavioral Observations at Far West School: A Description of Experience-Based Career Education
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CHAPTER 1

INTRODUCTION AND METHODOLOGY

The ETS evaluation of Experience-Based Career Education (EBCE) included, at one of the four sites--the Far West Laboratory for Educational Research and Development, behavorial observations as one component of the methodology. It was felt that such data would provide descriptive and analytic information capable of depicting the activities of EBCE students with a clarity not easily developed through other methods. Originally 80 behavioral observations were planned, to be divided among 20 students, each observed under two conditions at two points in time. Each student would thereby be observed four times. The two conditions were represented by the sites where students received training, that is, by resource sites or by Far West School (FWS).

Students were selected by random sampling procedures from the Far West Laboratory (FWL) EBCE student body. In most cases the students selected first agreed to be the subjects of observations. In those few cases where these students did not agree, they were replaced by randomly selected alternates. There was some attrition due to student absence, so that a total of 60 observations were actually completed. Each observation was targeted at 75-90 consecutive minutes of observational time. Actual time varied from the targeted time in order to conform more accurately to a coherent sequence of student behaviors.

With one exception, all observers used in this study had previously conducted behavioral observations in other studies. All observers were trained through simulated observations of volunteer EBCE students and other persons. Behavioral aspects of the students were emphasized throughout training; that is, observers were instructed to record what they saw and heard the student do, and to record the components of the environments which were, in the observer's judgment, affecting the student at the moment. Projective inference of the internal states of the student was not permitted if these states were not evident through the student's behavior, but such inference was considered desirable provided supportive behavioral evidence could be found.

An observation resulted in an observer's written description of a student's activities. In the process of observing the student, the observer separated the description into events. An event was considered to end (and

the next to begin) whenever a student's activity changed or the persons interacting with the student changed. The time at which an event began was recorded, so that, by differencing successive times, event durations could be calculated.

When an observation was completed it was transmitted to a coder whose first task was to study the event structure of the observation. Coders were instructed to separate an event into two or more events whenever it was apparent that the student's activities had changed within the observer-defined event, or whenever an event seemed to be of undue length. Having resolved any such problems which might have existed within the event structure of the observation, the coder next encoded the nature of each event comprising the observation. To do so, the coder relied upon a collection of descriptive code words known as the Lexicon.

The Lexicon consists of four types of words, each type descriptive of a different aspect of an event. The four types of descriptors are (1) context, which relates to the input and output of work and information during an event; (2) person, which is descriptive of the people with whom the student is engaged during the event; (3) materials, which describe tools, books, or equipment used by the student during the event; and (4) activities, which are descriptive of the student's behavior during the event. The word lists which comprise the Lexicon were originally developed during the coding process, adding new words as new event descriptors were needed. Later, the Lexicon was reviewed and revised and the observations recoded to incorporate the necessary revisions.

When coding had been completed, each event within an observation had been labeled with as many as four activity codes, one context code, one person code, one material code, the event duration in minutes, and identificational information. After all events had been coded, the encodement and its associated events were keypunched. The event was keypunched in plaintext English, verbatim, from the transcript provided by the observer, and then placed in a computer file.

Retrieval of keypunched observations was accomplished by computer and depended upon a software system titled, "APPLE" (1). The APPLE system was originally designed as a plaintext retrieval system for application to record-keeping systems such as those found in school systems and hospitals. Such records of individuals tend to be of varying length, varying format, and occur in varying (but

usually large) numbers within any given institution. APPLE was designed to allow search/sort retrieval operations on such records. As a system, APPLE is relatively unhindered by restrictions on the number of "documents" which may constitute an individual's file, on the format the documents may be in, and on the number of individuals' records which may comprise the record system.

Input to the APPLE system, in the application of this study, takes the form of a leading punched card bearing the event characterizations developed by the coder, followed by a string of punched cards containing the verbatim event transcript. Each successive event of an observation is similarly assembled on computer cards and input to the system.

Output from the APPLE system generally takes one or both of two different forms. Designated records or subsets of records can be output directly, as on a line printer, visual readout device, etc. Alternatively, sorting/counting information can be accumulated into a table to be retained within the computer for later manipulation by other programs. The observations input to the APPLE system are indexed by logical statements composed of Lexicon code words; that is, combinations of code words, connected by "and," "or," and "not" logical operators, serve to identify the kinds of events to be retrieved or otherwise manipulated by the system. Having provided the system with such a logical statement, APPLE then scans the records to select and manipulate those observations or events which meet the identificational requirements of the logical statement. By this means it is possible to select, as but one example, all events in which a target student was working with peers, using laboratory equipment at a resource site, and discussing his plans for the future. All events which meet these criteria can be printed, their durations accumulated, etc. It is believed that this project represents the first time that the APPLE system has been applied to the task of retrieving selected segments of behavioral observation data.

The behavioral observations were conducted within constraints provided by the student/school/resource/site/time environment. It was not possible, for example, to time-sample students for observational purposes. This serious limitation prevents inferences regarding the distributions of student time among the various activities in which students engage. Also, the number of different students observed is small relative to the size of the student body. This suggests that inferences should only be made with an understanding of the sampling errors associated with small samples.

There are, of course, the usual concerns for obtrusiveness of observers since they were physically present during the time of observation. While the experience of the observers enables them to fade into the background of a social setting, at least to some degree, there are still some instances in which target students related to the observer. Whether the presence of observers substantively modified the behaviors of students is not ascertainable.

Four students were simultaneously videotaped and observed as a component of the reliability evaluation for the observational system. It was the opinion of the observers that the videocamera was more disruptive and intrusive than the presence of the observers themselves. The analyses of the reliability of the observational procedure are present in Appendix A.

CHAPTER 2

OVERVIEW OF ACTIVITIES OBSERVED

It was intended that 20 randomly selected students would be observed four times each: twice in the Fall and twice in the Spring. During each time period each student would be observed once at a resource site and once at Far West School. As Table 1 indicates, the complete set of four observations was obtained only for nine of the targeted students.

Table 1

Number of Observations Obtained per Student

Four observations	9
Three observations	4
Two observations	6
One observation	-
Zero observations	1
TOTAL	20

Fall observations, conducted during November and December of 1974, resulted in 16 observations at resource sites and 14 observations at FWS. During the Spring observation period (March and April, 1975) 14 observations were collected at resource sites and 16 at FWS. Tables 2-5 provide single-sentence descriptions of the predominating activity observed during each of these observations. Observations are numbered so that the same student has the same number on each of the tables.

Two things are immediately noticeable. First, there is great diversity in the activities students engage in. This is especially so at the resource sites. Second, it can be observed that student resource site activities do, in fact, change. Only one student (No. 8) was observed twice at the same resource site. In all other cases the site and the nature of the students' activities had changed.

Table 2

Observations in Brief: Fall Resource Sites

1. Working with small children at nursery or preschool.
2. No observation.
3. No observation.
4. No observation.
5. No observation.
6. Working as disk jockey at radio station.
7. Visiting a mailing house (mailing/merchandising organization).
8. Dealing with psychologically and physically handicapped small children.
9. Working on an advertising campaign involving a marketing study of restaurants.
10. Dancing for television.
11. Working with blood samples in a medical laboratory.
12. Discussing student projects on rezoning and flood control with a county supervisor.
13. Working with resource person who arranges meetings with a knowledgeable person.
14. Discussion with architect regarding training and nature of work.
15. Learning astrology.
16. A session in photography and darkroom work.
17. Discussion at a campus Women's Center regarding counseling of women.
18. Working with assistant to city manager regarding a parking congestion problem.
19. Instruction on photography and darkroom work.
20. Practice in accounting concepts.

Table 3

Observations in Brief: Fall FWS Site

1. Algebra lesson.
2. No observation.
3. No observation.
4. No observation.
5. No observation.
6. Language practice: pronunciation of double letters and dipthongs.
7. English lesson: use of to, two, too; your, you're; paragraph writing; symbolism in literature.
8. Learning coordinator absent, others filling time.
9. Discussion regarding how to do a project plan in photography.
10. No observation.
11. Exercises in mathematics and French.
12. English writing, sentence structure.
13. No observation
14. Lesson in payroll bookkeeping.
15. Announcements of activities and a lesson in decision-making.
16. Students describe their projects to a school visitor.
17. Reading and translating French.
18. Student describes his studies of psychic phenomena.
19. Discussion regarding decision making.
20. Student doing advertisement layout.

Table 4

Observations in Brief: Spring Resource Sites

1. Project planning and questionnaire design for a human rights survey.
2. Observing a pilot flying a light aircraft.
3. No observation.
4. Filing forms in a clinic.
5. Doing clerical tasks for a learning coordinator, grading exams by key.
6. Filing folders in filing cabinets.
7. Discussion on advertising copy composition.
8. Dealing with psychologically and physically handicapped small children.
9. No observation.
10. Watching staff at radio station record a commercial.
11. Discussing outline of project regarding displacement of Japanese Americans in World War II.
12. Lesson in advertising principles and marketing.
13. No observation.
14. Cleaning a room, arranging tables and chairs, cleaning a bathroom.
15. No observation.
16. Instruction and discussion regarding a human rights survey.
17. Physicist discusses his work, students explore opportunities for doing projects at radiation laboratory.
18. No observation.
19. No observation.
20. Student assigns duties of advertising campaign to fellow students.

Table 5

Observations in Brief: Spring FWS Site

1. Discussion regarding recreational outing for class.
2. Doing problems in long division and fractions.
3. No observation.
4. Doing problems in algebra.
5. Doing exercises in Spanish.
6. Instruction in symbolism in literature.
7. Filling out student activity reports.
8. No observation.
9. Participating in "active listening" exercises.
10. A reading tutorial using material written by black writers of the fifties.
11. A general meeting between students, staff, learning coordinators, a reporter and an anthropologist.
12. Filling out a form and listening to a discussion.
13. Developing a project plan and filling out a project plan form.
14. English writing, parts of speech.
15. Participation in social science project regarding group dynamics, discussion of observing and questionnaires as data gathering media.
16. Doing algebra work problems.
17. Learning Coordinator provides student with progress review.
18. No observation.
19. No observation.
20. Geometry tutorial.

Activities at Resource Sites

In order for EBCE operations to comply with the EBCE conceptual model it would seem that a great number of diversified resource sites and resource persons must be involved in the educational process. Indeed, the heavy reliance on resource site activities seems to differentiate EBCE from other educational models. The number of different resource sites actively used by the Far West Laboratory is not estimable from the observational data, but something of the diversity of these sites can be noted. Students have been observed working with architects, counselors, assistant city managers, advertising specialists, merchandising specialists, physical therapists, astrologers, photographers, disc jockeys, aircraft pilots, teachers, physicists, and others. Their activities have ranged from routine clerical operations to the planning and conduct of social science surveys, from testing blood samples for syphilis to doing marketing research.

Resource site activities seem to go beyond the exposure of the traditional classroom, and frequently seem to deal with real world working and problem-solving situations. For example, one student worked with an assistant to a city manager, exploring complaints about illegal parking around a post office. As the following excerpt (2) from the observation indicates, the student was exposed to some of the political realities which are endemic to many levels of government.

> The resource person outlined the problem around a post office in West Oakland. Employees and people were not using the post office parking lot. The 2-hour parking around the post office was not being enforced. The street sweepers could not get through.
>
> Resource Person (to student): You could interview the postmaster--find out why people aren't using the parking lot.
>
> Student: Where is the post office located?
>
> The RP showed the student the location of the post office and the 2-hour parking lot on a map and indicated that merchants were complaining about the lack of street sweeping and enforcement of the 2-hour limit on parking.

The student asks for the postmaster's name and the student and the RP briefly discuss the interview.

RP: Remember, this is a black neighborhood. You must be sensitive. Do you want to interview some of the complainants?

The student indicates agreement.

Student: I will probably, from my knowledge of institutions, have to work through several layers [of people] to get to the postmaster. The more important the person, the more buffers he has. [Laughs.]

RP explains that his wife is a buffer to him, that the city manager couldn't function if he was constantly interrupted.

It is unlikely that a student in a traditional classroom could be brought into such working proximity with the necessity for sensitivity in dealing with minorities. It is similarly unlikely that classroom discussions could have presented the problem of buffering so realistically or meaningfully since the student was here in a situation where he would be required to deal with buffering in order to solve a problem.

Another student, dealing with psychologically and physically handicapped young children, assisted in physical therapy:

Student is holding child with teacher, swinging child, taking each child in turn. Then a vibrator is brought out.

Teacher: I haven't shown you how to use it.

Teacher turns on vibrator, uses it on a child.

Student then uses it on the child's back. Teacher brings over another child, student works with vibrator on new child, running the vibrator up and down the child's back and the backs of the child's legs.

Student puts vibrator away, then helps walk a child into a big room. Student gets a walking structure, helps child get into it, then leads the child around the room.

[Later, when the children are being put on a school bus, one of the children becomes overtly hostile and aggressive. He pulls a worker's earring so hard that the ear bleeds and kicks out a window in the school bus door.]

Aggressive "acting out" by young retardates is certainly beyond the normal classroom experience, yet it is something which frequently happens in the real world of those who deal with disturbed children.

Career Exposure

It may be interesting to evaluate the resource site activities to which students were exposed in terms of a number of dimensions by which occupations may be described (3). One such dimension is indoor-outdoor. Most of the resource site activities observed were indoor in nature. No activities were observed in which the predominating work normally took place outdoors. The marketing and advertising activities seen in Students 7, 9, and 12, for example, certainly have outdoor components, but the predominating activities are generally to be found indoors.

Urban-rural. All of the resource sites were situated in a densely urbanized area. Since this is the setting of the Far West Laboratory, such a result is not surprising, and may reflect an environmental limitation of EBCE operations. Advertising agencies tend, for example, to be a phenomenon of urbanicity. They are not generally found in small towns or rural areas. Advertising work, however, can be found in small town newspaper offices. This is the general pattern of urbanicity found in the resource sites observed--that while the work can frequently be found in an urban setting it may sometimes be found in smaller towns. Resource sites and occupations characteristic of rural settings were absent from the observations.

Salary level. The occupations to which students were exposed in the resource sites would typically produce lower-middle to upper-middle incomes. Clerical operations (filing folders, for example) are an example of the former; advertising executives are an example of the latter. Most of the occupations probably reside at mid-range or somewhat higher.

Physical effort requirements. Only one resource site involved activities requiring great physical effort (dancing--Student No. 10 during the Fall resource site visits). All other activities were predominantly sedentary although there was some minor variation in the level

of physical effort required. Physical therapy can require moderate levels of physical exertion, for example, but desk jobs tended to predominate.

Paperwork requirements. The range of paperwork requirements in the occupations represented was great. Dancing, at one extreme, requires virtually no paperwork. This is likely true also of several other occupations seen in Tables 2-5. The clerical occupations associated with filing folders, or with mass mailing operations represent another extreme, and the paperwork requirements of social science surveys, architectural work, accounting work, and work in the physical sciences probably falls somewhere in between.

Persuasivity requirements. The occupations represented in resource sites required job incumbents to exhibit varying degrees of direct persuasion upon other people with whom their jobs led them to interact. The job of assistant city manager is likely to be one where persuasivity is frequently required. Several other occupations are likely to require moderate amounts of persuasivity (architects, advertising and marketing, disc jockeys), and some occupations (dancing, clerical work) are apt to require little persuasivity.

Theoretical-practical. The theoretical-practical dimension was well represented in the resource sites observed. In the observation of Student No. 17 during the Spring resource site visits a group of students met with a nuclear physicist whose work was strongly theoretical. Photography, clerical work, disc jockey work, and other occupations, tend to be quite practical in nature, while the considerations of social science survey work and marketing work tend to fall somewhere in between.

Manual skill requirements. Physical therapy and piloting an aircraft require a certain level of manual skill. Other occupations represented in the resource sites observed seemed to have lower manual skill requirements. The high level of manual skill required of crafts and skilled trades was not represented in the sample.

Scientific-technical. The range of scientific-technical skills called for in the observed resource sites was considerable, and closely parallels the theoretical-practical dimension discussed above. Under this heading, however, we may note the work of medical technicians who must command a sizeable number of laboratory procedures, but whose work tends to be practical.

Work alone-work with others. Most of the resource sites exhibited occupations requiring intermittent contact with other people. The work of the physicist, however, may require only infrequent contact while that of physical therapists or nursery school teachers requires constant contact with large numbers of people.

Travel requirements. None of the occupations represented in the resource sites required extensive travel except, possibly, that of a pilot. Other high-travel occupations, such as truck drivers, distributors, and certain kinds of salesmen were not represented in the sample.

Prestigiousness. The prestigiousness of the occupations found at the resource sites is difficult to ascertain, but seems to be distributed in the low-to-moderate range. Clerical operations are not generally considered prestigious, and only sometimes are those of advertising executives, physicists, and politicians. On the other hand, a glamorousness may be noted in the occupations of disc jockey, dancer, and astrologist.

Directing others-directed by others. As nearly as the observational records disclose, the occupations represented at resource sites involved situations in which the incumbent worker directed those beneath him and was, in turn, directed by those above. That is, few of the occupations seemed to be occupations in which the incumbent was the sole director of his own activities, as would be the case with a small business owner, for example. Similarily, none of the occupations were necessarily those wherein the incumbent made none of the decisions affecting his own work.

Educational requirements. The requirements for formal, academic education varied appreciably across the occupations found in the sample. Dancing, for example, probably involves no requirement for formal, academic education while for nuclear physicists and psychological counselors such requirements are great.

Creativity. The creativity required of artists and musicians was possibly represented by the one student dancer who was observed; in general, however, the creativity requirements of the occupations were moderate to low. Of course, many occupations provide greater advancement and career opportunities to the individual who is seen as performing creatively, but such creativity is not generally characteristic of the occupation per se.

Mental effort requirements. The range of mental effort required of incumbents varied from very low (filing clerk or dancer, for example) to very great (physicist, for example). Other occupations tended to fall in between.

In summary of the characteristics of occupations to which students were exposed at resource sites, we may indicate that they were typically urban, middle-income occupations, but that such a stereotype as "middle-class" could be misleading since considerable diversity in occupations was found in most of the dimensions considered. Most of the occupations were indoor occupations and would probably require little physical work or manual skill to perform them adequately. Rural occupations and skilled trades were not present in the occupations noted at resource sites; neither were occupations typically characterized by the creativity of the incumbent nor those in which large amounts of travel were required.

The EBCE concept relies upon the availability of a large number of diversified resource sites as an integral component of the educational model; presumably, either a lack of resource sites or a lack of diversification among those available could weaken educational efficiency in any given application. In the example of the Far West Laboratory, 30 resource site observations were conducted in which the skilled trades were not present, yet these occupations comprise roughly 25% of the labor force. The discrepancy may be suggestive of a difficulty in locating, enlisting, retaining, monitoring, and coordinating the large numbers of diversified resource sites necessary to a complete EBCE model.

Student and Staff Behavior at the Resource Site

The EBCE concept represents a somewhat radical departure from traditional educational models since students visit, with increasing intensity of exposure, a variety of career or occupational sites at locations (generally) apart from the school. Without the control or supervision provided by the presence of teachers or other school officials, questions can arise regarding whether the behavior of students presents problems. The observations taken at resource sites do not reveal serious behavior problems among students.

Such problems as seemed to arise seemed also to be easily handled. They also seemed to occur in settings involving a group of students. No difficulty was noted

in which a single student was present with one or more resource persons, or when a single student was alone with the observer. The seriousness of the disturbances noted may be judged from the following excerpts:

> At a radio station students were ushered into a small room. The RP turned on the speakers in the room and left to get additional chairs. Two students start to dance the "Bump."
>
> When the RP returns one of the dancers asks if he can do the "Bump," and he and the girl dance for a minute or two.

Apparently the RP saw no problem in the students dancing, even though broadcasting was taking place in an adjacent room. In the same observation,

> ...one of the students poses everyone for a picture. Takes two pictures. Kids urge girl to go into booth and take picture of D.J.
>
> RP: No-no-no! (Points to red light which has come on over the door to the broadcasting booth.)

The intervention of the resource person seemed adequate to handle the problem. In this same observation the observer noted that:

> Kids constantly talk over and to each other--are pleasant--are noisy. RP ignores.

In another observation a couple of students played toss with a film canister and later a student held a door shut so that a classmate could not leave a photographic darkroom. The instructor's loud remark, "Alright, Harry," seemed sufficient to arrest the behavior.

In another observation students were requested not to smoke in certain areas, which seemed to arrest smoking. Somewhat later, when the roll was being called, an inattentive student was verbally jostled by having her name called sharply by a fellow student when she failed to answer the roll. The inattentive student rejoined with

> Student: Oh, how rude!
>
> Fellow student: (Smiles)
>
> Student: Crude and socially unacceptable!

From the language used by the student one surmises that some fur underlay the exchange. Whether this was so or not, the exchange lasted only for two minutes.

In another observation the resource person was attempting to get students to prepare "goals and indicators" statements in connection with their work on a survey of human rights. Several students were talking and joking among themselves, ignoring the proper activities of the session. Then the following event occurred:

> RP: That's your prime goal...to find out how much people know and how they feel about human rights.
>
> Target student helps other students to come up with their rewordings of "goals and indicators." The students laugh at what they are doing.
>
> RP says she is losing patience with the students and that she wants the students to get serious.

Since there is no additional mention of difficulty in the observer's record, the RP's rebuke of their behavior seems to have been adequate.

These examples seem to indicate that such behavior problems as may occur tend to be quite minor. It should be emphasized that these four examples comprise the entirety of problems noted in student behavior at resource sites. It may be significant that only the last example occurred during the Spring observations. All other difficulties were observed during the Fall. Our small number of observations does not allow reasonable statistical tests to be made on the Fall-Spring incidence of such problems, but should the pattern be generally found it might suggest a decline in student misbehaviors associated with maturation, or alternatively, it might suggest increasing satisfaction of students with their resource sites.

More typical of student behavior is an active participation in the educational process. Resource site observations during the Fall period revealed active student participation to be ongoing 71% of all time observed. During the Spring the same figure was 92%. Resource sites are sometimes noisy, sometimes quiet, but usually students are to be found working. The following observation is not unusual:

RP explains work duties to student, setting up binders for learning coordinators, explains new learning coordinator booklets.

RP: Will you set up the yellow pages?

Student asks about pink sheets, clarifies task.

RP: Where do you want to work?

Student: Here. (Clears desk.)

Student, smoking cigarette, sorts pages into stacks (four), piles stacks neatly. Takes one stack and strips yellow sheets off of backs. Student sits at desk, keeps working.

Observer touched some reading materials. RP, who was working with two girls, stops and invites observer to look at materials. Without encouragement, she explains materials to observer.

Student goes out of room.

Student: I'm going to get paper clips.

In two minutes student returns with clips.

RP goes back to two girls with calculator.

Student goes out of room with stacks of papers. Returns without papers, sits down.

Student (to RP): OK, you want these stripped and put in binders?

RP: Yes.

RP explains details, indicates that student will have new learning coordinator binder.

Student works, RP talks to observer (uninvited--RP is overattentive to observer). Students in hall are noisy. Student gets up, closes door noisily. RP is working with her tutors.

Student: You know what, (RP), some of these don't have holes punched.

RP: OK. You'll need to punch them.

Student, still sorting, has a paper clip in her mouth. Student now has things in color coded stacks. Takes sorted stacks out of the room. Comes back in.

Fellow student: Who did you call?

Student: Nobody. I was looking for the 3-hole punch. Couldn't find the 3-hole punch, only the 2-hole punch.

RP: Check with (name). She sometimes takes it.

Student leaves again, returns.

Student: (Name) said they were looking for it all morning. They couldn't find it.

RP: Just leave the papers stacked, otherwise they would have to be interfiled.

RP gives student more materials--30-question tests to score. Gives her the master. Student must compute number right.

RP: Use number correct.

RP shows student how to compute one.

Student checks test. Girls leave. Student keeps working. One girl returns, borrows income tax book to do payroll (her assignment). Girl returns, asks student if she has any money.

Student: I finished doing this.

Student goes to RP.

End of observation.

In this observation the student worked alone most of the time, productively, with little need for control or instruction from the resource person. In the next example, students have received instruction regarding the operation of a control console at a radio station and, as the excerpt begins, are watching the resource person and a fellow worker trying to synchronize recorded music with a voice tape of a commercial.

RP resets record, starts tape again. Fellow worker starts, then stops.

Fellow worker: That's not good.

RP restarts the record, tape still going. False start again. Restarts again. Other students have gone out to a food truck.

Student: That was 29 seconds.

RP: That was a good one.

Student: Yeh, I think so, too.

RP asks students to go into other room. Students do, start waiting for RP. Students eating. [Observation discontinued for 12 minutes.] Students waiting for RP, talking about different radio stations, yoga, about missing busses, general conversation. Talking about different people they know. Trying to get fellow worker to come out to model his suit. Talk to fellow worker about his prices and the kinds of clothes he makes.

Student gets up, goes into control room, sits down at console and works with it. Works controls playing different records. Fellow student works with controls playing different records. Student practices doing disc jockey role. Each student is going to take 10 minutes to read a public service announcement.

RP (to student): That was pretty good. That wasn't too bad.

RP (to student): That's pretty good. She didn't front intro that's so she can back into it.

End of observation.

Again, the picture is one of involvement, cooperation, and productive work, with students taking turns to read announcements and to work controls at the console.

The activities of students, whether performed alone or with other students, are centered about "projects," an example of which is a social science survey of peoples' perceptions of human rights. The duties necessary to the completion of a project are typically divided among the students, with the RP facilitating, instructing, and

providing access to facilities, supplies, equipment, and information. Students receive school credit for their participation in, and their products which result from, such projects. Observational data do not make clear the basis upon which the kind or amount of credit is determined. It is clear, however, that students have a concern for receiving credits, and that they sometimes act to modify their activities at resource sites so as to make needed credits available.

> At a medical clinic two students are filing file folders. Target student has explained task to fellow student and they work quietly. The folders are to be filed by name, alphabetically. There seems to be a couple of thousand folders altogether.
>
> After working for a while target student (TS) goes to receptionist, asks if she has pamphlets which she can use to do her papers on. Receptionist shows her where they are kept.
>
> TS and fellow student go to shelves where they are kept, look through the shelves. They pick out some pamphlets for their project papers, go into another room, out of sight of observer. This is a room with more literature supplies.
>
> They take literature into waiting room, sit down, talk about what they should be doing to get their credit for science. TS and fellow student plan how to work out joint project to get most that they want. They talk about things that happen at school during the day, then about what they are going to do to turn project around for science credit. They decide that since their RP is in a staff meeting they will call her later and tell her that they aren't there to do filing, they should be getting science credit.

Observations discussed earlier suggest the modes of resource person activity. Teaching occurs by demonstration, discussion, and lecture, when there seems a need for instruction. Relations between students and resource persons seem uniformly good. No observation suggested a resource person who was disliked by the students.

Special Problems

No special problems were found in connection with resource sites. In one observation, however, it was noted that students on the way to or from resource sites

were sometimes stopped by policemen who demanded explanations of why they were not in school. EBCE students seem to have identification cards and, in the observation where this problem was noted students were encouraged to ask the officer to contact the school. It might also be possible to remedy this problem by printing an explanation of the student's presence on the back of the identification card.

Activities at Far West School

Half of the observations were taken at Far West School in Oakland, California where EBCE students received the balance of their training. The EBCE setting is characterized by several marked deviations from a traditional high school. Classrooms seem open and both students and staff enter and leave classromoms with considerable freedom. Instruction seems individualized and self-paced to a great degree, with tutors available for a variety of purposes. As Tables 3 and 5 indicate, observers were present while students were tutored in algebra, English, French, Spanish, and geometry. In the following excerpt a student is working on quadratic equations in algebra. A tape recorder apparently carries some of the instruction, in connection with a set of problems.

> Student picks up head set, turns back on recorder. Listens to one side of headset, works with the recorder, continues to listen.
>
> Fellow student No. 2 (FS2) gets up from table, asks student a question. Student responds, then FS2 leaves the room. She (FS2) is upset because she cannot get into the room of a substitute LC to get the information she needs.
>
> Student: (Name), you haven't finished your class yet.
>
> FS2 walks away.
>
> Students puts down headset, turns off recorder, works on problems on paper again. Continues to work on problems on paper.
>
> Tutor comes out of office, goes over to student, looks over her shoulder, asks her how she is doing.

Student: Alright.

Student continues to work on problems.

Tutor comes over.

Tutor: Take your time in the beginning. You're supposed to go slow. Getting the first unit is important to how you do on the other units. Have you gotten to the formula yet?

Student: I've gotten to page 36.

Other student comes in, starts playing guitar. Principal comes in, picks up a screen, leaves. Tutor continues to explain the quadratic equation.

Tutor: You have to be able to read and understand what is asked for.

Apparently, the entrance of the principal and even that of a student playing a guitar is not seen as objectionable in the classroom, and the observer's record does not indicate an adverse reaction to disturbance. In another observation, however, one student was distracted by another while being instructed by a tutor. The lesson dealt with the pronunciation of double letters and dipthongs.

Student and fellow student talked briefly.

Fellow student: I wrote a 30-word commercial.

Tutor: OK, let's get on with this.

Tutor then pronounced a sound and gave its rule, e.g., the sound of "oa" as in "boat." Student asked for a repeat.

Tutor: I don't repeat it during a test. Ok, I'm going to write these without drawing lines. Read them off to me.

Students then read the sounds and tutor wrote them on the board. A student walked in, asked where to check out tape recorders, was told they didn't have any, and left.

Student: You missed one.

Tutor: Give me the sound of it.

Student: That's one I missed.

The mild rebukes delivered by the tutor ("OK, let's get on with this" and "I don't repeat it during a test") might be interpreted as arresting the interruption of an immediate instructional activity between the tutor and a student. Firmer measures are brought to bear on students who are more disruptive.

> Student shows up with buddy (fellow student). Fellow student argues with tutor about his presence.
>
> Tutor tells him that this is a class, that he was distracting before, and that he must go.
>
> Fellow student and student argue. Fellow student is not malicious--just persistent--pesky.
>
> Other student sticks head in, assists tutor. Fellow student leaves. Girl joins us.

The argument between the disruptive student and the tutor accounted for three minutes of class time at the beginning of the class. Later in this observation we encounter good examples of instructional individualization.

> Target student and another receive instruction in the proper use of "to, too, and two," then receive instruction in the proper use of "its, it's," then in "your, you're."
>
> Another student discusses with the tutor credit associated with a creative writing project in music history.
>
> Tutor returns previously written paragraphs to two other students, asks them to rewrite the paragraphs.
>
> Tutor tells target student and creative writing student to write answers to one of several letters to "Dear Abby."
>
> Discusses symbolism in connection with literature, indicates that they would be dealing with "Lottery" next.
>
> Supervises students taking turns reading from "The Lottery."

As one might suspect, individualized, self-paced instruction creates a need for monitoring the progress of individual students. This need apparently is met through

the combined record-keeping efforts of the school and the students, together with the presence of learning coordinators (LCs) who function in the capacity of educational monitors and advisors to students. The following is one example of such activities:

> Student and LC are sitting at a table. LC asks student how she is feeling (student has been ill). LC asks student about world studies final. Student answers. LC gets call from another LC to pick up telephone. He reaches across table, answers phone, talks about calendar of principal's meeting.
>
> LC sits down, says student should start an anthropology project.
>
> Student: Couldn't I do something at the Y? They are starting a project on how kids learn.
>
> LC: What do you see yourself doing with them?
>
> LC repeats question.
>
> LC: What do you see yourself doing with them? Feeding them? Taking them on trips?
>
> Student: Yeh, I think so.
>
> LC: You must do more writing. That can be an offshoot of an anthropological project. Work on some project plans. You missed a package meeting and must pick up extra. . . for time left. Outside work experiences.
>
> Student: All principal said I needed was a synopsis. Also I need to go to (radiation laboratory) for biology credit.
>
> LC: What are you going to do with the banking visit?
>
> Student: Drop it.
>
> LC: We have to do something with it--history of banking systems--yes or no?
>
> Student: Yes.
>
> LC: Project plans--can you get this together? Then we can talk about specifics. Let's at least get world studies and then think about

the banking. I don't want to leave everything to the last minute . . . .There are probably some things which occurred to you about banking.

Student: (Silence)

LC: How did they get started?

Student tries to answer, is unable.

LC asks some more questions about banking and tells about banking experiences during the depression.

LC: What would your reaction be?

Student: I don't know. I would be upset.

LC: You might want to look at some things that have happened in banking. That might be interesting. You have to develop some more resources.

The LC talks about other questions to work on.

Student: OK.

LC: How are your tutorials doing?

Student: OK.

They talk about how student was angry with tutor for not giving credit after finishing certain books. LC asks student about other tutors.

Student: OK.

LC: Well, that's all.

End of observation.

Record retention requirements are extensive and were noted in several observations. Students are sometimes involved in the maintenance of school records as a resource site activity. The observation reported on pages 18 and 19 represents one example of such activity; Student No. 6 on Table 4 represents another. It would seem that this use of students is triply profitable: first, of course, it reduces the cost of school operations by using student help; second, the student is taught some skills associated with file management; and third, the student receives a more intimate and comprehensive view of the inner workings

of the high school. One possible result of having students more involved in the operation of daily school activities might be better student-school relations since students would have less reason to perceive their peers as "us" and the school as "them."

Student Activity Reports are completed and turned in by students as one means of monitoring student activities.

> LC started meeting congratulating group for turning in activity reports. He said he was discouraged though, because only 50 of his group had had RP visits during the week. Some of the students are seniors, and their lack of activity is understandable since they don't need many credits to graduate. He castigates others for not working up to capacity.
>
> LC: Has everybody got their SAR [Student Activity Report]? I think everyone did something related to school over Easter week.

Another means of monitoring student activities and progress, and also causing the student to plan his activities is a project planning form which students complete.

> Target student seated at table completing a FWL student project plan form. Fellow Student (FS) asks target student if he can help target student.
>
> Student: Hey, man, you could get me a cup of coffee.
>
> FS: OK, you in a hurry.
>
> Student indicates he would like it as soon as possible.
>
> FS: Three sugars, right?
>
> Student nods.
>
> Student quietly writing. Fills out form in architectural block printing. Filling out spaces in neatly lettered sentences. FS returns, drops off coffee. Student continues with form. Refers back to cover sheet (brief description of project, questions to be answered) while doing section. He is doing "goals and indicators." Also refers to instruction on back of 2-page form. Still

working. Has now added booklet (social science package goals) to set of materials he looks at to complete form. Appears to be doing a careful job of compiling plan. Other students pass through. One asks target student for a cigarette, then asks observer. Target student just keeps working--pays little or no attention to traffic. Sips his coffee occasionally. Still working.

Student meeting breaks up in LC's office. Four or five students pour out. One student sits beside target student. They exchange a few quiet words.

LC comes out.

Student: Hey, LC.

Student hands LC plan he has been working on. Lights cigarette while LC reads plan.

Student: The only problem is the RP.

LC suggests he could check stockbrokers, people in business school. Suggests that student might do it with another student.

Student: I don't think so.

Student explains that he wants some individualized "brain-storming." LC, with the plan in hand, goes to door in middle office and asks students to turn radio down. LC and student talk about plan. Student can't think of any kind of "career awareness stuff." LC suggests market analysts, stockbrokers, looking at careers associated with plan.

LC indicates that the plan must have careers associated with it at some point.

LC: Look at resources.

LC works on, student also.

Student comes over to observer.

Student: Excuse me, I'll be back in a minute.

Student comes right back. Looks at package goals again. Folds up materials, prepares to leave.

> Observer asks student if he can look at his plan. Student explains how form works, that it works well if one starts with theme, then goes to questions, then to goals and indicators, etc.

The completion of such forms may be quite useful, but they are also apparently demanding of time. In one observation the target student ignored the class discussion going on about him while he filled out a form. It is not apparent from the observer's record that the form was school related but it does raise the question of whether the necessary recordkeeping activities are burdensome.

Individualized student activities also require extensive work on the part of school personnel tc keep abreast of happenings which might be of use to students, and to communicate such opportunities to students. Several observations involve time periods during which announcements are made concerning projects which are about to begin, educationally valuable television shows, and concerning meetings and events of interest.

The EBCE activities of Far West School have attracted some attention as was illustrated in two observations. In one, a reporter from the New York Times and an anthropologist were present at a joint meeting of students and staff; in the other, a visitor from the Fresno School District heard students discuss the projects they were working on.

The novelty of being associated with such a school, receiving attention from scientists, reporters, and officials from other schools, the freedom of leaving the school to visit resource sites, and the individualized attention provided students may explain the good relationship which seems to exist between students and school staff. It is apparent, however, that EBCE at Far West School is not a panacea for the ills of education. At Far West, as as other schools, students can be inattentive, students can be bored, students can be lazy and unproductive. A lack of comparative data disables any evaluation of how well Far West School and the EBCE effort overcome such problems, but it is clear that, at least for some students, the Far West approach is attractive. As one student put it, when asked by an RP whether he liked Far West School, "Yes. I like it better than my old school. You get to do things that are interesting."

CHAPTER 3

STUDENT OUTCOME OBJECTIVES

It was indicated in the Introduction that observations were computer stored for retrieval indexed by code words in the APPLE system. The collection of code words, referred to as the Lexicon, was revised collaboratively between ETS and Far West Laboratory, and the computer-stored information updated to reflect these changes. By assembling logical sequences of code words it is possible to selectively retrieve observational events having designated characteristics. One of the intentions of such retrieval was to gain some insight regarding the degree to which students were meeting the "Student Outcome Objectives" set forth by the EBCE program (4). These objectives are

> . . . statements of what FWS graduates will know or be able to do. They are organized into three broad categories: career development, basic skills, and life skills--each with two or more subheadings. . . . (5)

The logical sequences of code words used to retrieve observational events related to the Student Outcome Objectives were developed jointly by ETS and FWL staff. Eight goals were to be explored by this process: (1) self-understanding, (2) self-reliance and responsibility, (3) oral communications skills, (4) interpersonal skills, (5) problem-solving skills, (6) decision-making skills, (7) skills of inquiry, and (8) career decision-making and planning skills. The results of analysis were not generally fruitful.

> (1) Self-understanding. The student will demonstrate awareness and understanding of his (or her) own current interests, abilities, values, and limitations relevant to career goal selection and achievement, and recognize that these may change with further education or experience.

No events were observed which met all of the conditions of this objective. It must be recognized, however, that the conditions are very restrictive and that they likely require unusual environmental situations to produce observable behavior indicative of the objective. We find no events in which a student indicated that his current interests, abilities, values, or limitations

might change with further education or experience. No events were observed in which students manifested behaviors indicating that their interests, abilities, values, or limitations were relevant to career goal selection and achievement. Only a few events indicated direct behavioral evidence of interests, abilities, values, or limitations, and these are of relatively low utility to measurement of the objective.

In one event students were discussing, in conjunction with a student project, the fact that the floor of a restaurant was dirty. One student suggested that each member of the project team could take five dollars to clean the floor. The target student rejoined, "I'll never scrub floors for five dollars." This certainly suggests a value-position on the part of the target student, but it is only remotely related to the objective.

In another observation, a student responded to a direct question from an RP by indicating that she was interested in teaching and counseling. Beyond such an indication of interest, the student provided no information regarding perceptions of relevance of her interest to the career areas involved.

In yet another event students were asked by an LC to write down two lists: the first a list of career options available to them if they graduated from high school, the second a similar list under condition that they did not graduate. The target student was observed to say, "I could get a McDonalds' job. I have worked in worse places." This could be interpreted as an indication of a mild dislike for such work, coupled with a statement of his ability to tolerate it. Still, for the purposes of this objective, the event is quite oblique.

(2) Self-reliance and responsibility. The student will demonstrate self-reliance and ability to function responsibly and independently in daily activities; i.e., he will be able to plan activities and manage time and other resources to accomplish goals, keep commitments to others, follow through on planned activities seeking guidance or assistance as necessary, evaluate his own behavior and performance, and accept responsibility for actions taken.

As before, observational material never completely demonstrates the complete requirements of this objective; however, several events seem to be related and we have previously mentioned several instances. Additional examples would include the following:

A student has just been assigned a self-study problem in accounting. The RP indicated to the observer that he was interested in seeing how much the student could do in studying on his own.

RP (to student): I don't know how long this is supposed to go.

Student: We spend 75 hours on a project, but I can go longer if I want to.

RP: Do you understand the difference between debits and credits?

Student: No.

RP explained, asked occasional questions in an illustration of what would be debits and what would be credits. Student responded correctly each time.

RP continued with a demonstration problem, student staying with him.

RP: Was it hard reading?

Student: No. I had to go over it a couple of times, but it was interesting. I do "1" through "10," plus those three?

RP: Yeah. Do you have anyone over there who can help you?

Student: No, but I'll check it every night to keep it fresh.

This student seems willing to accept the responsibility for his own learning activities. By contrast, one student resisted:

Student comes in, sets things down on table. Goes over to wall, sharpens pencils, sits down at table. Tutor gets tape, sets tape up at desk.

Student: Do I have to go over there?

Tutor: Yes.

Student: Oh, I don't want to go over there. I don't want to sit by her (fellow student).

Tutor: This is the only place where there are plugs.

Student: Oh, alright.

Student gets up, goes over to desk, sits down.

Tutor: I need another tape. No, you are working on unit 3, aren't you?

Student: No.

Tutor: Yes--I want you to work on this, then I will give you a test on these problems.

In a different observation a girl pointedly ignored the proper activities of the class:

Fellow student directs a question to target student. She responds by laughing. Puts her head down and laughs. Fellow student No. 3 starts reading.

Target student pulls gently on ear lobes, stares out of window, play with hair, smokes a cigarette. She is busy communicating her boredom with the class reading while it is being read. Both fellow students read well, students, including target student, listening quietly. Target student using body language as described above but is quiet.

Alternatively, this student seems alert, responsible, and task-oriented:

Student and RP are doing physical therapy with small children.

Student returns. RP explains to student and to teaching assistants that they are going to clear the room so they can do what they did the other day.

Student cleans up. One child whimpers. Student picks him up as she cleans. Student at one end of room, RP at the other. They attempt to roll kids from one to another.

RP: Here he comes.

Student rolls him back. (This is a difficult task--student must straighten out kids' arms, legs each roll. Kids can't roll themselves.)

Student and RP talk to kids, encourage them, all during process. They take kids one at a time. It becomes Annie's turn, nicknamed, "Apple Annie."

Student: She doesn't mind this time.

RP: Yes. She usually cries. That's good.

Student and RP start swinging kids.

Five of the 60 completed observations provide evidence of irresponsible behavior on the part of students. In all other observations the student was either not behaving irresponsibly or was in some way overtly acting in a responsible manner. Such overt responsibility was found in 12 of the 60 observations.

(3) Oral communications. (a) The student will communicate facts, ideas, and feelings in a manner that is effective and appropriate to various situations (social, school, or work). (b) The student will listen effectively.

We interpret this objective from the viewpoint of the student; that is, speech would be considered to be effective and appropriate if the student achieved a desired effect through the medium of speech. Within this interpretation, a student may intend to disrupt the activities of others, may attempt to do so through speech, and may succeed. If he does, we interpret the student's mastery of the language as being sufficient to accomplish his intention, that it was effective and appropriate to the situation which he wished to change. Also within the scope of this interpretation we consider speech to be effective and appropriate to the situation if the student responds minimally to questions directed to him. "Um-hmm," signifying "yes" would be considered appropriate and effective in response to a question such as, "Have you finished your work?" Also considered appropriate and effective would be statements or questions directed to one or more people in order to transmit or obtain information.

Within the scope of this objective, interpreted as indicated, only on observation failed to demonstrate effective and appropriate speech--in that case the student did not speak within the hearing of the observer during the period of observation other than to greet acquaintances.

(4) Interpersonal skills. (a) The student will effectively participate in peer and adult interactions based on understanding of roles and obligations, respect for individual rights and perceptions, and ability to contribute to the resolution of conflicts resulting from differing personal needs and values. (b) The student will cooperate with others as a means of attaining goals.

We have already illustrated a number of observational segments which display competent interpersonal skills among students. We have also displayed the few situations in which interpersonal behaviors were less than might be desired. In the main, there is reason to believe that these students function at an adequate level of interpersonal skills, as such skills are defined by the outcome objective.

There is some suggestion that resource persons deal with students more on an adult-to-adult level than do FWS staff, where students are possibly more paternalized, and that students respond to the adult or adolescent roles accordingly. Evidence supporting this view is not clear, however, and we suggest the result be regarded as conjectural in absence of corroboration.

(5) Problem-solving skills. (a) The student will define a problem by identifying a need or a discrepancy between what is and what he thinks should be. This can be in a personal, group, societal, academic, or career situation. (b) The student will use a variety of sources and techniques of data gathering. (c) The student will propose or generate alternative solutions, anticipate consequences of various solutions, choose or combine solutions, and implement a chosen course of action.

We have no examples which directly meet the criteria of this outcome objective. For example, no student was ever observed to indicate that something was a problem since it was one way when it should be another. We do, however, infer the existence of problem-solving behaviors from events in which students seek information.

The predominant mode of information seeking observed was questions directed to peers, resource persons, and FWS staff. In some cases the questioning was intense, as exemplified by Student No. 17, Table 2, at a counseling center:

Student takes papers out. Asks RP what problems women bring into Center most. Student asks question about cultural differences in counseling. RP answers questions fully.

Student asks questions about counseling teenagers vs. adults. RP answers fully.

Student asks questions about comfort when counseling men. RP answers question about counseling young people (apparently, RP did not understand the question).

Student asks questions about matching race of counselor to race of counselee. RP answers.

Student asks about open group sessions. RP answers.

Student asks about how teenagers come to Center. RP answers.

Student asks how Center got started.

RP: One of the students from Far West last year wanted to sit in on my groups, then to set up groups for young people.

Student asks about pay for counselors. RP answers.

Student asks about demand for counselors in a few years. RP answers.

Student: How did the Center get started?

RP answers.

Student asks about fund raising. RP answers.

Student is clicking pen with legs crossed and other hand to mouth.

Fellow student asks about possibilities for a project.

RP answers. Pauses.

There are also appeals for assistance, effected verbally, as illustrated by a student using a microscope:

Student: I can't get it--can't see anything.

Employee: Well, that's an oil lens, isn't it? Here, look around the back of the lens. Doesn't it say, "oil"?

Student: Yes.

Employee: Well, the lens has to touch the plate.

Employee adjusts microscope so that the lens touches the plate, looks in the microscope. Then turns, picks things up off counter.

Student looks into microscope.

Student: OK. Thanks very much.

We have reported an example of students asking for pamphlets which would be helpful in the conduct of their projects. Such activities are in the minority, however. Generally, recourse to written materials was not observed to be initiated by the student except in cases where the materials had been assigned by staff or resource persons. A few observations yield examples of individuals recommending reference materials to students, as illustrated by the following example:

Student talks about telepathic plants.

Students discuss experiences with care of plants.

LC says she can get reference books to help.

Fellow student talks about his experience with vitamins and plants.

LC says she has an experiment which students could do with plants.

Student works on filling out schedule.

LC asks about other things.

LC: Have you studied how temperature, soil, water, affect plants?

LC says student needs to get more books.

Sometimes students show unusual ingenuity in gathering information. In one such case it was required to develop a list of names of people who worked in proximity to a certain restaurant as part of an advertising study.

One student contributed to the solution of this problem by entering office buildings and photographing the directories of offices within them. Students in that same project made use of street maps to locate competing businesses.

(6) Decision-making skills. (a) The student will recognize decisions that need to be made, including when they must be made. (b) The student will identify alternative choices or options and their probable outcomes. (c) The student will identify personal values and goals which relate to the decision being made. (d) The student will choose the alternative that fits best with personal values and goals. (e) The student will accept responsibility for his decision.

A great difficulty is inherent in the evaluation of this objective, namely, that the term "decision" is not defined. As Miller, Galanter, and Probram (6) have illustrated through hypothetical constructs they call "TOTEs," virtually any human behavior can be cast meaningfully into a decision-making framework. In the same way, "problem-solving" can be used as the descriptive phrase. Decision-making and problem-solving have such similar import that the Thesaurus of Psychological Index Terms indexes both under the category of "cognitive processes."

Accordingly, we consider that the comments made in relation to "problem-solving" apply as well to decision-making. We have no observational data which present a student saying, "I must make a decision here . . . the alternatives are (a) . . . (b) . . . and the probable outcomes of each are . . . ." There is, however, an appreciable quantity of material already presented which displays students working alone, with peers, with FWS staff, and with resource persons in constructive ways, wherein one would infer that decision-making is going on.

(7) Skills of inquiry. The student will develop and expand his skills of inquiry and critical thinking including such functions as classifying, comparing/contrasting, defining, interpreting, generalizing, inferring, hypothesizing, predicting, analyzing, synthesizing, and evaluating events and written or spoken material.

Observational data do not lend themselves readily to the task of evaluating this outcome. We have indicated

that students do not seem hesitant to ask questions to get information or assistance, but we observed little information regarding "critical thinking," apart from such events as have already been discussed.

(8) Career decision-making and planning. (a) The student will have a positive attitude toward planning his future education, career(s), and lifestyle. (b) The student will have integrated (related) information about occupations with information about self. (c) The student will have located and used information about occupations. (d) The student will know some of the factors associated with selected occupations that contribute to job success and job satisfaction. (e) The student will have obtained employment information, completed job applications, taken interviews, written letters of application, prepared a resume. (f) The student will have demonstrated that he has made an informed decision regarding his post-high school educational/vocational plans. (g) Those students who have tentatively selected a career area will have begun to acquire some of the related job-entry skills and experience. (h) The student will know the functions, characteristics and requirements of a broad range of self-selected occupations.

Observational data also yield little information related to these outcomes. In particular, we have no evidence bearing directly on outcomes (a), (f), and (g). We also have little evidence bearing directly on the remaining outcomes, except that we know students have had some exposure to them. The visits of students to resource sites undoubtedly confer upon the student some indication of whether or not he might enjoy certain kinds of occupations (objective (b)), and in many cases the work of students at resource sites requires that the student know something about the occupations which reside there (objective (c)). It is likely that students would also learn, at the resource sites, something about the factors which contribute to job success and job satisfaction. This was most directly observed when students visited a physicist who inquired about their mathematical skills--it was evident that the need for mathematics in physics struck the students as somewhat awesome in comparison to their existing mathematical capabilities. In a number of observations students asked resource persons regarding the training required of people in selected occupations.

Such observations would relate to outcome (d). Outcome (e), relating to job applications, interviews, resumes, etc., was never directly observed, but in one event a tutor discussed the W-4 income tax form.

Outcome (h) is likely an exception to the rule. The changing resource sites visited by students almost certainly provide an exposure to a number of different occupations. On such limited data we cannot discuss the breadth of the students' understandings, but it would seem likely that these students would be more directly exposed to the inner workings of a number of self-selected occupations than would students in traditional high school settings.

CHAPTER 4

BEHAVIOR CHANGES

Students were observed at two points in time so that an analysis of changes in student behaviors becomes possible. It will be recalled that three classificatory kinds of information are available: the descriptive code words of the Lexicon, the number of events during which certain behaviors were observed, and the durations of those events. Preliminary analyses suggested that numbers of events were not meaningful and could be misleading, since an active setting could produce a great number of events with little change in descriptive lexicography. Attention was therefore directed to measuring changes in the durations of student behaviors and the settings within which students were observed.

Tables 6 and 7 display the summaries which were produced by the APPLE system for this purpose. Table 6 presents data from the Fall sequence of observations; Table 7 presents Spring data. To illustrate the interpretation of these tables, consider the row of Table 6 labeled, "ADULTGRP." The Lexicon (Appendix C) defines "ADULTGRP" as an acronym representing "Adult Group," and refers to a situation in which the student is involved with a group of adults. The adults may be LC's, RP's, or may be adults from the public domain, rather than those associated with EBCE. In Table 6 we note that only one of the 78 events comprising resource site ("Job Site" in in Table 6) observations during the Fall involved a student interacting with a group of adults. This interaction was brief since it lasted but three minutes (out of 889 minutes of observations at Fall resource sites). The event comprises 1.3% of all Fall resource site events (1/78 x 100 = 1.3), and the 3-minute duration represents .3% of the total Fall resource site observational time.

The statistical procedure used to evaluate changes in student behaviors consisted of placing 95% confidence intervals about the proportion of time which students spent in various activities, with certain kinds of people, using certain "tools," and in various contexts. Whenever the two confidence intervals corresponding to Fall and Spring observations were disjoint (i.e., did not overlap) the proportion of time was considered to have changed between Fall and Spring. The structure of the confidence intervals was that suggested by Hays (8). While a reasonable method, the procedure relies upon the binomial proportion being approximately normally distributed. The

TABLE 6

Fall Observation at FWL--Frequencies and Duration of Lexicon Codes

VARIABLE	CODE	JOB SITE TOTAL FREQ	JOB SITE TOTAL TIME	JOB SITE PCT FREQ	JOB SITE PCT TIME	LAB SITE TOTAL FREQ	LAB SITE TOTAL TIME	LAB SITE PCT FREQ	LAB SITE PCT TIME	ALL SITES TOTAL FREQ	ALL SITES TOTAL TIME	ALL SITES PCT FREQ	ALL SITES PCT TIME
ALL EVENTS		78	889			112	690			190	1579		
PERSON													
	ADULTGRP	1	3	1.3	.3	5	21	4.5	3.0	6	24	3.2	1.5
	ALONE	1	20	1.3	2.3	12	76	10.7	11.0	13	105	6.8	6.6
	FELLWRDK	7	109	9.0	12.3	0	0	.0	.0	7	109	3.7	6.9
	LEARNCOR	0	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	LEARNSED	36	369	46.2	41.5	54	419	48.2	60.7	90	788	47.4	49.9
	OTHSTAFF	0	0	.0	.0	1	2	.9	.3	1	2	.5	.1
	PEER	1	10	1.3	1.1	8	20	7.1	2.9	9	30	4.7	1.9
	PEERGROU	4	47	5.1	7.5	4	26	3.6	3.8	8	93	4.2	5.9
	PUBLIC	4	40	5.1	4.5	4	11	3.6	1.6	8	51	4.2	3.2
	RESPERSN	17	182	21.8	20.2	0	0	.0	.0	17	182	8.9	11.4
	STAFFGRL	7	82	9.0	9.2	0	0	.0	.0	7	82	3.7	5.2
	TUTOR	0	0	.0	.0	24	115	21.4	16.7	24	115	12.6	7.3
CONTEXT													
	COMMUNTY	32	364	41.0	40.9	52	373	46.4	54.1	84	737	44.2	46.7
	EXCHANGE	16	182	20.5	19.6	24	110	21.4	14.5	40	267	21.1	17.4
	INSTRUCT	13	157	16.7	17.7	10	69	8.9	10.0	23	226	12.1	14.
	PRODUCNG	0	0	.0	.0	2	13	1.8	1.9	2	13	1.1	.8
	RECEIVNG	5	36	6.4	4.0	3	11	2.7	1.6	8	47	4.2	3.0
	TRANSITN	2	52	2.6	5.8	0	0	.0	.0	2	52	1.1	3.3
	WORKING	10	113	12.8	12.7	21	124	18.8	18.0	31	237	16.3	15.0
MATERIALS													
	ARTMATER	2	10	2.6	1.1	0	0	.0	.0	2	10	1.1	.6
	LARGFLD	2	13	2.6	1.5	0	0	.0	.0	2	13	1.1	.8
	MAPGRAPH	3	17	3.8	1.9	1	15	.9	2.2	4	32	2.1	2.0
	MEDITOOL	2	41	2.6	4.6	0	0	.0	.0	2	41	1.1	2.6
	NA	58	657	74.4	73.9	64	386	57.1	53.0	122	1323	64.2	64.8
	PRINTMAT	2	21	2.6	2.4	1	8	.9	1.2	3	29	1.6	1.4
	REALWRLD	1	16	1.3	1.8	3	29	2.7	4.2	4	45	2.1	2.8
	REFBOOK	1	36	1.3	4.0	0	0	.0	.0	1	36	.5	2.3
	TESTEQUI	0	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	TEXTBOOK	4	52	5.1	5.8	17	97	15.2	14.1	21	149	11.1	9.4
	VSUALAID	0	0	.0	.0	2	18	1.8	2.6	2	18	1.1	1.1
	WORKBOOK	0	0	.0	.0	1	12	.9	1.7	1	12	.5	.8
	WORKBARD	3	26	3.8	2.9	23	145	20.5	21.0	26	171	17.7	10.8
ACTIVITY													
	ADMINTS	19	149	24.4	16.8	12	93	10.7	13.5	31	242	15.3	15.3
	ADVISNG	1	9	1.3	1.0	3	36	2.7	5.2	4	45	2.1	2.8
	ALTSOLU	2	22	2.6	2.5	3	18	2.7	2.6	5	40	2.6	2.5
	ANSQUES	22	193	28.2	21.7	22	135	19.6	19.6	44	328	23.2	20.8
	ASKQUES	21	226	26.9	25.4	15	91	13.4	11.7	36	317	18.9	20.1
	ASSIGNM	7	60	9.0	6.7	9	57	8.0	8.3	16	117	8.4	7.4
	ASSISTG	1	11	1.3	1.2	1	2	.9	.3	2	13	1.1	.8
	ASSTREQ	1	9	1.3	1.0	0	0	.0	.0	1	9	.5	.6
	ASSTWAT	2	14	2.6	1.6	1	6	.7	.9	3	20	1.5	1.3
	BIOSCI	1	4	1.3	.4	1	8	.9	1.2	2	12	1.1	.8
	BLENDNG	2	36	2.6	4.0	0	0	.0	.0	2	36	1.1	2.3
	BUSTUFF	7	63	9.0	6.9	3	12	2.7	4.6	10	84	5.2	5.1
	CARFUL	5	93	7.7	10.5	5	53	6.4	9.1	12	156	6.3	9.9
	CONCURR	5	44	6.4	4.9	3	22	2.7	3.2	8	66	4.2	4.2
	CONSIDR	4	36	5.1	4.0	0	0	.0	.0	4	36	2.1	2.3
	COURSELA	2	15	2.6	1.7	0	0	.0	.0	2	15	1.1	.9
	EXPLAIN	4	33	5.1	3.7	2	9	1.3	1.3	6	42	3.2	2.7
	FLYING	0	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	FUTPLAN	3	28	3.8	3.1	0	0	.0	.0	3	28	1.6	1.8
	GETADRS	5	58	6.4	6.5	5	33	4.5	3.3	10	91	5.3	5.8
	GETEQUI	1	9	1.3	1.0	0	0	.0	.0	1	9	.5	.6
	GETINST	6	87	7.7	9.8	7	39	6.3	5.7	13	126	6.8	8.0
	GIVINST	0	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	HISTORY	3	31	3.8	3.5	0	6	.0	.0	3	31	1.6	2.0
	INANSLIS	0	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	INFGATH	0	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	INSTRAT	1	28	1.3	3.1	1	7	.9	1.0	2	35	1.1	2.2
	INQUIRY	3	68	3.8	7.6	1	6	.9	.9	4	74	2.1	4.7
	INTCORR	4	52	5.1	11.1	23	148	20.5	21.6	27	248	14.2	15.7
	LAYOUT	1	20	1.3	2.2	26	204	32.1	29.6	37	311	19.5	19.8
	LISTENG	22	206	28.2	23.3	28	241	25.0	34.9	50	537	26.3	34.0
	MATHEMA	1	24	1.3	2.7	12	86	10.7	12.5	13	110	6.8	7.0
	MEDIATE	11	130	14.1	14.6	1	15	.9	2.2	12	145	6.3	9.2
	NONE	0	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	NOTEBOOK	4	66	5.1	7.4	2	6	1.8	.9	6	72	3.2	4.6
	OBSERVG	2	20	2.6	2.2	1	6	.9	.9	4	26	2.1	1.6
	OPALOOK	1	15	1.3	1.7	24	205	30.4	37.0	25	220	13.4	17.1
	OPALSOC	9	144	12.3	15.2	15	84	13.4	12.2	23	228	12.1	14.4
	OPALWRK	16	197	20.5	22.2	11	79	9.8	11.4	27	276	14.2	17.5
	OTHER	0	60	2.6	6.7	2	26	1.8	3.8	4	86	2.1	5.4
	PERLAST	1	14	1.3	1.6	0	0	.0	.0	1	1	.5	.1
	PHYSACT	0	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	POSITION	3	52	3.8	5.8	3	15	2.7	2.2	6	67	3.2	4.2
	PRIMARA	4	99	5.1	11.1	4	29	3.6	4.2	8	128	4.2	8.1
	PUBTALK	10	113	12.8	12.7	0	0	.0	.0	10	113	5.3	7.2
	READLIT	1	6	1.3	.7	2	10	1.8	1.4	3	15	1.6	.9
	REFLECT	7	65	9.0	7.3	14	138	12.5	20.0	21	203	11.1	12.9
	RUTAWAY	2	24	2.6	2.7	1	21	2.7	3.0	3	46	2.6	2.9
	SCRAPBK	1	5	1.3	.6	1	10	.9	1.4	2	15	1.1	.9
	SLOWDOWN	6	32	6.4	3.6	7	74	6.3	10.7	13	106	6.3	6.7
	SUBSTEP	0	0	.0	.0	3	17	2.7	2.5	3	17	1.6	1.1
	SUMMING	2	7	2.6	.8	2	8	1.8	1.2	4	15	2.1	.9
	SUMMARY	0	17	.0	4.0	0	0	.0	.0	0	17	.0	1.1
	SUMMARZ	2	18	2.6	2.0	0	0	.0	.0	2	18	1.1	1.1
	SYSTEM	0	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	SUITABIL	2	11	2.6	1.2	3	18	2.7	2.6	5	29	2.6	1.8
	TAKNOTE	2	28	2.6	3.1	2	8	1.8	1.2	4	36	2.6	2.3
	THEMATIC	0	0	.0	.0	1	12	.9	1.7	1	12	.5	.8
	VALUEST	4	37	5.1	4.2	5	35	4.5	5.1	9	72	4.7	4.6
	WRITING	3	35	3.8	3.9	3	30	2.7	4.3	6	65	3.2	4.1

TABLE 7

Spring Observation at FIL--Frequencies and Duration of Lexicon Codes

VARIABLE	CODE	JCT SITE				LAJ SITE				ALL SITES			
		TOTAL FREQ	TOTAL TIME	PCT FREQ	PCT TIME	TOTAL FREQ	TOTAL TIME	PCT FREQ	PCT TIME	TOTAL FREQ	TOTAL TIME	PCT FREQ	PCT TIME
ALL EVENTS		104	670			93	788			197	1458		
PERSON													
	ADULTGRP	1	5	1.0	.7	0	0	.0	.0	1	5	.5	.3
	ALONE	11	57	10.6	8.5	8	82	8.6	10.4	19	139	9.6	9.5
	FELLAPRC	5	14	4.8	2.1	0	0	.0	.0	5	14	2.5	1.0
	LEARNCOM	0	0	.0	.0	8	23	8.6	2.9	8	23	4.1	1.6
	LEARNGRP	48	324	46.2	48.4	50	458	53.8	58.1	98	782	49.7	53.6
	OTHSTAFF	2	3	1.9	.4	4	14	4.3	1.8	6	17	3.0	1.2
	PEER	7	60	6.7	9.0	4	11	4.3	1.4	11	71	5.6	4.9
	PEERGRPOL	4	15	3.8	2.2	2	13	2.2	1.6	6	28	3.0	1.9
	PUBLIC	10	63	9.6	9.4	3	24	3.2	3.0	13	87	6.6	6.0
	RESOTHST	13	82	9.6	12.2	0	0	.0	.0	13	82	6.1	5.6
	STAFFGRP	4	47	3.8	7.0	0	0	.0	.0	4	47	2.0	3.2
	TUTOR	0	0	.0	.0	14	163	15.1	20.7	14	163	7.1	11.2
CONTENT													
	COMPUTN	53	402	51.0	60.0	39	455	41.9	57.7	92	857	46.7	58.8
	EXCHANGE	9	26	8.7	3.9	7	29	7.5	3.7	16	55	8.1	3.8
	INSTRUCT	16	116	15.4	17.3	22	123	23.7	15.6	38	239	19.3	16.4
	PROCEDRE	3	16	2.9	2.4	2	2	2.2	.3	5	18	2.5	1.2
	RECEIVNG	0	0	.0	.0	2	12	2.2	1.5	2	12	1.0	.8
	TRANSFTN	3	9	2.9	1.3	4	9	4.3	1.1	7	18	3.6	1.2
	WORKING	20	101	19.2	15.1	17	158	18.3	20.1	37	259	18.8	17.8
MATERIALS													
	ARTMATER	0	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	LANGUAGE	0	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	MAPGRAPH	0	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	MEDITOOL	0	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	NA	84	485	80.8	72.4	68	483	73.1	61.3	152	968	77.2	66.4
	PRTTOOL	0	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	PROJMATR	5	26	4.8	3.9	5	51	5.4	6.5	10	77	5.1	5.3
	REFMATER	0	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	TESTGOOD	2	53	1.9	7.9	0	0	.0	.0	2	53	1.0	3.6
	TEXTBOOK	0	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	VOCALAID	8	84	7.7	12.5	0	0	.0	.0	8	84	4.1	5.8
	WORKBOOK	0	0	.0	.0	14	199	15.1	25.3	14	199	7.1	13.6
	WORKCARD	5	22	4.8	3.3	6	55	6.5	7.0	11	77	5.6	5.2
ACTIVITY													
	ADMINIS	9	34	8.7	5.1	13	81	14.0	10.3	22	115	11.2	7.9
	ADVISNG	2	5	1.9	.7	0	0	.0	.0	2	5	1.0	.3
	ALEGGLU	0	0	.0	.0	1	13	1.1	1.6	1	13	.5	.9
	ANSGUES	6	41	5.7	6.1	9	69	9.7	8.8	18	110	9.1	7.5
	ASKGUES	6	38	5.8	5.7	6	16	6.5	2.0	12	54	6.1	3.7
	ASSIGNM	4	26	3.8	3.9	3	31	3.2	3.9	7	57	3.6	3.9
	ASSISTG	3	36	2.9	5.4	1	17	1.1	2.2	4	53	2.0	3.6
	ASSTAAT	1	1	1.0	.1	5	28	5.4	3.6	6	29	3.0	2.0
	BIOSCI	0	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	BLENDNG	5	29	4.8	4.3	0	0	.0	.0	5	29	2.5	2.0
	BUSINESS	2	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	CALLER	2	7	1.9	1.0	1	5	1.1	.6	3	12	1.5	.8
	CENCOMP	3	12	2.9	1.8	9	37	9.7	4.7	12	49	6.1	3.4
	CENSION	5	15	4.8	2.2	3	27	3.2	3.4	8	42	4.1	2.9
	COMPLA	1	2	1.0	.3	1	15	1.1	1.9	2	17	1.0	1.2
	EARSPEN	7	57	6.7	8.5	7	70	7.5	8.9	14	127	7.1	8.7
	FLYING	4	22	3.8	3.3	0	0	.0	.0	4	22	2.0	1.5
	FLYPLAN	7	57	6.7	8.5	4	65	4.3	8.2	11	122	5.6	8.3
	GETAGNS	2	11	1.9	1.6	6	110	6.5	14.0	8	121	4.1	8.3
	GETSUGI	2	11	1.9	1.6	3	34	3.2	4.3	5	45	2.5	3.1
	GIVINSI	8	67	7.7	10.0	7	76	7.5	9.6	15	143	7.6	9.8
	HISTGOV	1	20	1.0	3.0	1	32	1.1	4.1	2	52	1.0	3.6
	INVSTGT	0	0	.0	.0	0	0	.0	.0	1	20	.5	1.4
	INFCATH	2	2	1.9	.3	0	0	.0	.0	2	0	.0	.0
	INITIAT	3	24	2.9	3.6	3	31	3.2	3.9	6	55	3.0	3.8
	INJURY	4	25	3.8	3.7	4	61	4.3	7.7	8	86	4.1	5.9
	INTRUST	4	25	3.8	3.7	4	74	4.3	9.4	8	139	4.1	9.5
	LANGANT	11	98	10.6	14.6	15	192	16.1	24.3	26	227	13.2	15.6
	LISTENG	2	22	1.9	3.3	18	229	19.4	29.1	20	251	10.2	17.2
	MATHMA	18	159	17.3	23.7	18	105	19.4	13.8	36	264	18.3	18.4
	MOTIATC	2	6	1.9	.7	12	128	12.9	25.1	14	204	7.1	14.0
	NEG	29	141	27.7	21.3	0	0	.0	.0	29	143	14.7	9.8
	NURTURT	0	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	OBSERVE	3	31	2.9	4.6	0	0	.0	.0	3	31	1.5	2.1
	ORALSGN	4	63	3.8	9.3	0	0	.0	.0	4	63	2.0	4.3
	OUTSIDE	3	8	2.9	1.2	23	296	24.7	37.6	26	304	13.2	20.9
	PEALANS	8	53	7.7	7.9	15	75	16.1	9.5	23	128	11.7	8.8
	PEERS	27	247	27.9	36.9	1	4	1.1	.5	30	251	15.2	17.2
	PERSONT	0	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	PHYSSEL	0	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	POSSESS	4	64	3.9	9.6	0	0	.0	.0	4	64	2.0	4.4
	PRONOUN	2	4	1.9	.6	3	26	3.2	3.3	5	30	2.5	2.1
	QUERIES	0	0	.0	.0	4	14	4.3	1.8	4	14	2.0	1.0
	READING	37	260	37.6	37.6	0	0	.0	.0	37	260	18.8	17.8
	RECEIVE	2	20	1.9	3.0	1	5	1.1	.6	3	25	1.5	1.7
	REFUSE	10	101	9.6	15.4	1	26	1.1	3.3	11	126	5.6	8.6
	RELAXAT	3	5	2.9	.7	4	22	4.3	2.8	7	27	3.6	1.9
	RESPOND	1	6	1.0	.9	3	4	3.2	.5	4	10	2.0	.7
	RESTING	5	30	4.8	4.5	1	5	1.1	.6	6	35	3.0	2.4
	REVIEW	0	0	.0	.0	2	31	2.2	3.9	2	31	1.0	2.1
	SAYING	1	10	1.0	1.5	2	11	2.2	1.4	3	21	1.5	1.4
	SEEKINF	4	29	3.8	4.3	3	26	3.2	3.3	7	80	3.6	5.5
	SIGNALS	0	0	.0	.0	0	0	.0	.0	0	0	.0	.0
	SPEECH	6	21	5.8	4.2	10	76	10.8	10.0	16	107	8.1	7.3
	SUGGEST	1	2	1.9	.3	2	14	2.2	2.3	3	20	1.5	1.4
	TAKEOUT	2	11	1.9	1.6	3	32	3.2	4.1	5	43	2.5	3.1
	TELLING	0	0	1.9	2.7	1	10	1.1	1.1	3	28	1.5	1.7
	TESTING	1	2	1.0	.3	1	4	1.1	.5	2	6	1.0	.4
	TOUCHING	2	8	1.9	1.2	11	108	11.8	13.7	13	116	6.6	8.0

approximation becomes increasingly poor as the observed proportion is quite small or quite large so that intervals were not constructed where the greatest of the two proportions (Fall or Spring) was less than .05. No cases occurred in which proportions exceeded .95. For proportions of .05 or more, the intervals give results similar to those of Clopper and Pearson (9), which are exact.

> Precautionary note: While students were randomly selected for this study the time periods of observation were not. Confidence intervals, which represent inferential statements regarding the distribution of student times are, therefore, technically invalid. Nonetheless, a number of useful patterns seem to emerge from the data when subjected to such analyses. We offer these results because of their possible interest, but we offer them without technical warranty of any kind.

A summary of significant changes appears in Table 8. Ninety-five percent confidence intervals are presented in the form (.02, .05), for example, which represents the following more complete notation:

$$Pc\ (.02 \leq p \leq .05) = .95.$$

This interval, which appears under Fall resource sites for the ADULTGRP code, may be interpreted as follows: during the Fall resource site visits we may state, with 95% confidence, that the incidence of a single student, involved with a group of adults, occupied between 2% and 4% of all student time. It will be noted that a number of comparisons result in 95% confidence intervals for which the upper limit of the lower interval is equivalent to the lower limit of the upper interval. These have been treated as representing a significant change in Table 8 although any significance of the difference would be regarded as marginal. In a number of cases no tests were conducted owing to small proportions; it is expected

Table 8

Significant Changes in Behavior Between Fall and Spring Observations
(Proportions of Total Time)

Variable Code	Resource Site		Far West School		Total	
	Fall	Spring	Fall	Spring	Fall	Spring
Person:						
ADULTGRP[α]	NT		NT		NT	
ALONE	(.02,.05)	(.07,.11)↑	NS		(.05,.08)	(.08,.11)↑
FLLWWORK	(.10,.15)	(.01,.03)↓	NT[β]		(.10,.15)	(.01,.03)↓
LEARNCOR	NT[γ]		NT		NT	
LEARNGRP	(.38,.45)	(.45,.52)↑	NS		NS	
OTHSTAFF	NT		NT		NT	
PEER	(.01,.02)	(.07,.11)↑	NT		NT	
PEERGROU	(.06,.09)	(.01,.04)↓	NT		(.05,.07)	(.01,.03)↓
PUBLIC	(.03,.06)	(.07,.12)↑	NT		(.02,.04)	(.05,.07)↑
RESPERSN	(.18,.23)	(.10,.15)↓	NT[β]		(.10,.13)	(.05,.07)↓
STAFFPBL	NS		NT[β]		(.04,.06)	(.02,.04)↓
TUTOR	NT[γ]		NS		(.06,.09)	(.10,.13)↑
Contexts:						
COMBINTN	(.38,.44)	(.56,.64)↑	NS		(.44,.49)	(.56,.61)↑
EXCHANGE	(.16,.22)	(.03,.06)↓	(.12,.17)	(.03,.05)↓	(.15,.19)	(.03,.05)↓
INSTRUCT	NS		(.08,.12)	(.13,.18)↑	NS	
PRODUCNG	NT		NT		NT	
RECEIVNG	NT		NT		NT	
TRANSITN	(.04,.08)	(.01,.02)↓	NT		NT	
WORKING	NS		NS		NS	

Table 8 (Cont'd)

Variable Code	Resource Site Fall	Resource Site Spring	Far West School Fall	Far West School Spring	Total Fall	Total Spring
Materials:						
ARTMATER	NT		NT		NT	
LABEQUIP	NT		NT		NT	
MAPGRAPH	NT		NT		NT	
MEDITOOL	NT		NT		NT	
NA	NS		(.49,.57)	(.58,.65)↑	NS	
PHTOTOOL	NT		NT		NT	
PROJPAPR	NT		NS		(.02,.04)	(.04,.07)↑
REFNBOOK	NT		NT		NT	
TESTEQUI	(.00,.00)	(.06,.10)↑	NT		NT	
TEXTBOOK	(.04,.08)	(.00,.00)↓	(.12,.17)	(.00,.00)↓	(.08,.11)	(.00,.00)↓
VSUALAID	(.00,.00)	(.10,.15)↑	NT		(.01,.02)	(.05,.07)↑
WORKBOOK	NT		(.01,.03)	(.22,.28)↑	(.00,.01)	(.12,.15)↑
WORKPAPR	NT		(.18,.24)	(.05,.09)↓	(.09,.12)	(.04,.07)↓
Activities:						
ADMINIS	(.14,.19)	(.04,.07)↓	(.11,.16)	(.08,.13)↓	(.14,.17)	(.07,.09)↓
ADVISNG	NT		(.04,.07)	(.00,.00)↓	NT	
ALTSOLU	NT		NT		NT	
ANSQUES	(.19,.25)	(.05,.08)↓	(.17,.23)	(.07,.11)↓	(.19,.23)	(.06,.09)↓
ASKQUES	(.24,.30)	(.04,.08)↓	(.10,.14)	(.01,.03)↓	(.18,.22)	(.03,.05)↓
ASSIGNM	NS		(.06,.11)	(.03,.05)↓	(.06,.09)	(.03,.05)↓
ASSISTG	(.01,.02)	(.04,.07)↑	NT		NT	
ASSTREQ	NT		NT		NT	
ASSTWAI	NT		NT		NT	
BIOSCI	NT		NT		NT	
BLENDNG	NS		NT		NT	
BUSINESS	(.04,.08)	(.00,.00)↓	NT		(.04,.07)	(.00,.00)↓
CAREER	(.09,.13)	(.00,.02)↓	(.07,.11)	(.00,.01)↓	(.09,.11)	(.00,.01)↓
CONCURR	(.04,.07)	(.01,.03)↓	NT		NT	
CONSIDR	NT		NT		NT	

Table 8 (Cont'd)

Variable Code	Resource Site		Far West School		Total	
	Fall	Spring	Fall	Spring	Fall	Spring
Activities: (Cont'd)						
CORRELA	NT		NT		NT	
EXPOPIN	(.03,.05)	(.07,.11)↑	(.01,.02)	(.07,.11)↑	(.02,.04)	(.07,.10)↑
FLYING	NT		NT[β]			
FUTPLAN	(.02,.04)	(.07,.11)↑	(.00,.00)	(.06,.10)↑	(.01,.03)	(.07,.10)↑
GETAPPR	NT		(.02,.05)	(.12,.17)↑	(.02,.04)	(.07,.10)↑
GETEQUI	NT		NT		NT	
GETINST	NS		(.04,.08)	(.08,.12)↑	NS	
GIVINST	NT		NT		NT	
HISTGOV	NT		NT		NT	
INDSOLU	NT		NT		NT	
INFGATH	NT		NT		NT	
INITIAT	NT		(.00,.02)	(.06,.10)↑	(.02,.03)	(.05,.07)↑
INQUIRY	NS		(.00,.02)	(.07,.12)↑	(.04,.06)	(.08,.11)↑
INTRUPT	NS		NS		(.14,.18)	(.18,.23)↑
LANGART	NT		NS		NS	
LISTENG	(.30,.36)	(.21,.27)↓	(.31,.39)	(.12,.16)↓	(.32,.36)	(.16,.20)↓
MATHEMA	NT		(.10,.15)	(.22,.28)↑	(.06,.08)	(.12,.16)↑
MEDIATC	(.12,.17)	(.18,.25)↑	NT		NS	
NONE	NT		NT		NT	
NONPART	(.06,.09)	(.03,.06)↓	NT		NT	
OBSERVG	(.01,.03)	(.07,.12)↑	NT		NT	
ORALSCH	NT		NS		(.15,.19)	(.19,.23)↑
ORALSOC	(.14,.19)	(.06,.10)↓	NS		(.13,.16)	(.07,.10)↓
ORALWRK	(.20,.25)	(.33,.41)↑	(.09,.14)	(.00,.01)↓	NS	
OTHER	(.05,.09)	(.00,.00)↓	NT		(.04,.07)	(.00,.00)↓
PERFART	NT		NT		NT	
PHYSSCI	(.00,.00)	(.08,.12)↑	NT		NT	
POSSOPP	(.04,.08)	(.00,.02)↓	NT		NT	
PREPARA	(.09,.13)	(.00,.00)↓	NT		(.07,.10)	(.01,.02)↓

Table 8 (Cont'd)

Variable Code	Resource Site Fall	Resource Site Spring	Far West School Fall	Far West School Spring	Total Fall	Total Spring
Activities: (Cont'd)						
PRJOBSK	(.15,.20)	(.36,.43)↑	NT		(.08,.11)	(.16,.20)↑
PROBLID	NT		NT		NT	
PROJDEC	(.06,.09)	(.13,.18)↑	(.17,.23)	(.02,.05)↓	(.11,.15)	(.07,.10)↓
PUTAWAY	(.05,.08)	(.00,.02)↓	NT		NT	
RECACTI	NT		NT		NT	
REPORTG	NT		(.09,.13)	(.00,.01)↓	(.06,.08)	(.02,.03)↓
RESISTN	NT		NT		NT	
REVIEWG	NT		NT		NT	
RSPONSB	(.03,.06)	(.06,.10)↑	NT		(.02,.03)	(.04,.07)↑
SHAKNOW	(.05,.09)	(.00,.00)↓	NT		NT	
SOCSCI	NT		(.00,.00)	(.08,.12)↑	(.00,.00)	(.06,.09)↑
SUPRAPL	NT		NT		NT	
TAKNOTE	(.06,.10)	(.01,.03)↓	NT		NT	
USEKNOW	NT		NT		NT	
VALUESY	NT		NT		NT	
WRITING	NT		(.03,.06)	(.11,.16)↑	(.03,.05)	(.07,.10)↑

Notes: ↑ The two 95% confidence intervals suggest a significant increase in time expended under this classification.

↓ The two 95% confidence intervals suggest a significant decrease in time expended under this classification.

NT Not tested. Both estimated proportions were under 5%.

NS The two 95% confidence intervals intersect, suggesting no significant change in time expended under this classification.

α For definition of Lexicon acronyms see Appendix C.

β Not tested since the acronym applies only to resource sites.

γ Not tested since the acronym applies only to lab. sites.

that the fact of their small size reflects their small impact on the whole of student times.

Person-contact variables illustrate a number of changes at resource sites, but not at Far West School. Between the Fall and Spring observations, the times expended by students working alone was increased. There were attendant increases in the times students spent in groups of peers under the supervision of resource persons where some form of instruction occurred, in situations with a single fellow student, and in situations where the students were in the presence of clients, observers, or other "public" (i.e., non-EBCE) individuals. There were associated declines in the times students spent with resource employees (including the RP), and with groups of fellow students. The concatenation of these changes suggests that the person-contacts of students became less social in character between the Fall and Spring, and that instructional groups became slightly more prevalent. We have no data which suggest underlying reasons for such changes, but possible explanations could include a relaxation of controls as students mature, coupled with an intensification of individual student task-completion activities as the year's end nears. No testable changes at Far West School showed significant differences in person-contacts between the Fall and Spring observations.

Contextual codes reflected changes in both school and resource sites. Interactive information exchanges at resource sites increased appreciably between the two observation periods, but no associated changes were noted at FWS. The increase in interactive exchange at the resource sites was accompanied by a decrease in interactions not related to the task at hand. This would support the idea of an increasing seriousness of students as the year's end nears. Also noted was a decrease in transition activities, activities characterized by neither input not output on the part of the student.

At the school site, student contexts were characterized by a decrease in situations where the student both gave and received inputs not related to the task at hand, and by an increase in times wherein students were in instructional contexts.

Use of textbooks and various forms of working papers declined at Far West School between the Fall and Spring observations. There was an associated increase in the use of workbooks, but this increase does not wholly compensate for the declines; rather, there was an increase in situations where students were observed without books, papers, equipment, etc. Changes were less dramatic at the resource sites where slight increases in the use of test equipment and visual aids were accompanied by slight declines in the use of textbooks.

Student activity indicators, where testable, generally reflected concordant changes in both the school and resource sites. There were but two exceptions: (1) time spent in work-related verbalizations and (2) participation in project-related decision-making, planning, etc. In these exceptional cases increases were noted at resource sites and decreases noted at Far West School.

Apart from such discrepancies, where changes were noted at both school and resource sites, the changes were in the same direction. There were decreases in time spent by students in personal administrative activities, in dealing with questions (related to careers, or questions in general), in time spent listening to someone else talking, and in time spent seeking (or receiving) information relating to careers or expressing opinions about careers.

There were increases, at both sites, in time spent expressing opinions and in the planning of future activities related to projects or work.

Most frequently, changes in student activities were specific to either resource sites or to the school site (i.e., a significant change was found at one but not the other). Activity changes peculiar to resource sites included:

Decreases in Time Spent

- Working in the subject area of business and economics
- Doing two things at once (e.g., filling out a form while listening to a conversation)
- Working in the subject area of the nonperforming arts (e.g., painting, photography)
- Talking about social activities
- Working with unusual subject areas (e.g., psychic phenomena)
- In situations where students failed to capitalize on learning opportunities
- In preparatory activities
- In cleanup activities (putting away materials, etc.)

- In the process of communicating knowledge to others
- In note taking

Increases in Time Spent

- In situations exposed to the techniques and uses of mass media (radio, advertising, TV, interviewing, etc.)
- Observing or watching something relevant to the learning process
- Working in the physical sciences
- Using or being instructed in practical job skills
- In the exercise of behaviors characterized by responsibility

Activity changes unique to Far West School included:

Decreases in Time Spent

- Offering advice or influencing decisions to be made
- Receiving assignments or work to be done
- Reporting on work done or to be done

Increases in Time Spent

- Receiving praise or approval for activities
- Receiving instructions for accomplishment of current tasks
- Displaying initiative
- Asking questions related to the learning experience at hand
- Engaged in the subject area of the social sciences
- Writing

Taken in concert, these results seem to indicate three distinct cluster of student dynamics which changed between the Fall and Spring observations. First, there

was an apparent shifting incidence of student participations in various subject matter areas. Times expended in business and economics, in the nonperforming arts, and in unusual subject areas declined, while times expended in the physical sciences, the social sciences, and the media increased.

Second, there were modifications in instructional procedures. Times spent in instructional groups increased, use of textbooks declined, use of workbooks increased, use of working papers of various kinds declined, practical job skills received more emphasis, time spent in writing increased, fewer assignments were handed out, instructions for conduct of current tasks occupied more time, and student reporting on work declined.

Third, and perhaps most important, there were indications of maturational changes in students. Socializations with peers declined, while working in instructional groups increased; inattentive behaviors, such as filling out forms while listening to class discussion, declined; talk about social activities declined while work-related discussions increased; responsible behaviors at resource sites and displays of initiative at FWS were more pronounced, and students were more likely to grasp the learning opportunities presented to them.

Comparisons of School and Resource Sites

Precautionary Note: While students were randomly selected for this study the time periods of observation were not. Confidence intervals, which represent inferential statements regarding the distribution of student times are, therefore, technically invalid. Nonetheless, a number of useful patterns seem to emerge from the data when subjected to such analyses. We offer these results because of their possible interest, but we offer them without technical warranty of any kind.

The APPLE-produced data of Tables 6 and 7 can also be used to describe changes in student behavior between the resource sites and the school. The methodology used is similar to that of the previous section, except that comparisons were limited to lexicography which, over all observations at the two sites at one point in time, comprised 5% or more of the total observation time. In this way the approximate confidence intervals function with reasonable accuracy and attention is concentrated on matters which represent substantial amounts of student time. The results are presented in Table 9 in format similar to that of Table 8. As before, disjoint 95% confidence intervals are taken as the indication of a significant difference between the time expended at the resource site and the time expended at the Far West School; also as before, tangent intervals should be considered as representing marginal significance of the difference between proportions.

Whenever an activity was more consuming of time at Far West School than at the resource sites, "FWS" was entered in the "where more common" column of Table 9. In the opposite situation "RS" appears. A corresponding entry is made in the "consistently more common" column of Table 9 if the proportions are significantly different between sites for both Fall and Spring observations, and if the differences are in the same direction, i.e., that either more time is expended at resource sites than at FWS in both Fall and Spring, or that more time is expended at FWS than at resource sites in both Fall and Spring.

The large number of "NT" entries in Table 9 reflects the fact that a large number of student activities, contexts, tools, and person-contacts represent quite small increments of student times.

It is perhaps surprising to discover that the temporal distribution of student activities is not more disparate across sites. Only 14 consistent differences were noted between the sites. Fellow workers, resource persons, and staff-public contacts are more frequent at resource sites, and tutors more common at FWS because the Lexicon reserves these terms for the respective sites. The only meaningful person-contact difference between sites is to be found in learning groups which take up a greater share of the student's time at FWS than at the resource sites. No consistent differences in context (which refers to the input/ output characteristics of information and work flow) were found between the sites, and only two "tool" differences were noted. Equipment, supplies, texts, papers, etc., are more associated with school activities than with resource site activities, as are working papers (a term which included students' class notes).

Table 9

Comparisons of Student Behaviors at FWS and Resource Sites*

Variable Code	Fall Observations RS	Fall Observations FWS	Fall Observations Where More Common	Spring Observations RS	Spring Observations FWS	Spring Observations Where More Common	Consistently More Common
Persons:							
ADULTGRP[α]	NT[β]			NT			
ALONE	(.02,.05)	(.09,.14)	FWS	(.07,.11)	(.08,.13)	(NS)	
FLLWWORK	(.10,.15)	γ	RS	NT			RS
LEARNCOR	NT			NT			
LEARNGRP	(.38,.45)	(.57,.64)	FWS	(.45,.52)	(.55,.61)	FWS	FWS
OTHSTAFF	NT			NT			
PEER	NT			NT			
PEERGROU	(.06,.09)	(.03,.06)	RS	NT			
PUBLIC	NT			(.07,.12)	(.02,.04)	RS	
RESPERSN	(.18,.23)	γ	RS	(.10,.15)	γ	RS	RS
STAFFPBL	(.07,.11)	γ	RS	NT			RS
TUTOR	δ	(.14,.20)	FWS	δ	(.18,.24)	FWS	FWS
Contexts:							
COMBINTN	(.38,.44)	(.50,.58)	FWS	(.56,.64)	(.54,.61)	(NS)	
EXCHANGE	(.16,.22)	(.12,.17)	(NS)	NT			
INSTRUCT	(.15,.20)	(.08,.12)	RS	(.15,.20)	(.13,.18)	(NS)	
PRODUCING	NT			NT			
RECEIVNG	NT			NT			
TRANSITN	NT			NT			
WORKING	(.11,.15)	(.15,.21)	FWS	(.13,.18)	(.17,.23)	(NS)	

Table 9 (Cont'd)

Variable Code	Fall Observations RS	Fall Observations FWS	Fall Observations Where More Common	Spring Observations RS	Spring Observations FWS	Spring Observations Where More Common	Spring Observations Consistently More Common
Tools:							
ARTMATER	NT			NT			
LABEQUIP	NT			NT			
MAPGRAPH	NT			NT			
MEDITOOL	NT			NT			
NA	(.71,.77)	(.49,.57)	RS	(.69,.76)	(.58,.65)	RS	RS
PHTOTOOL	NT			NT			
PROJPAPR	NT			(.03,.06)	(.05,.08)	(NS)	
REFNBOOK	NT			NT			
TESTEQUI	NT			NT			
TEXTBOOK	(.04,.08)	(.12,.17)	FWS	NT			
VSUALAID	NT			(.10,.15)	0	RS	
WORKBOOK	NT			0	(.22,.28)	FWS	
WORKPAPR	(.02,.04)	(.18,.24)	FWS	(.02,.05)	(.05,.09)	FWS	FWS
Activities:							
ADMINIS	(.14,.19)	(.11,.16)	(NS)	(.04,.07)	(.08,.13)	FWS	
ADVISNG	NT			NT			
ALTSOLU	NT			NT			
ANSQUES	(.19,.25)	(.17,.23)	(NS)	(.05,.08)	(.07,.11)	(NS)	
ASKQUES	(.24,.30)	(.10,.14)	RS	NT			
ASSIGNM	(.05,.09)	(.06,.11)	(NS)	NT			
ASSISTG	NT			NT			
ASSTREQ	NT			NT			
ASSTWAI	NT			NT			
BIOSCI	NT			NT			
BLENDING	NT			NT			
BUSINES	(.04,.08)	(.03,.06)	(NS)	NT			

Table 9 (Cont'd)

Variables Code	Fall Observations RS	Fall Observations FWS	Fall Observations Where More Common	Spring Observations RS	Spring Observations FWS	Spring Observations Where More Common	Spring Observations Consistently More Common
Activities: (Cont'd)							
CAREER	(.09,.13)	(.07,.11)	(NS)	NT			
CONCURR	NT			NT			
CONSIDR	NT			NT			
CORRELA	NT			NT			
EXPOPIN	NT			(.07,.11)	(.07,.11)	(NS)	
FLYING	NT			NT			
FUTPLAN	NT			(.07,.11)	(.06,.10)	(NS)	
GETAPPR	NT			(.01,.03)	(.12,.17)	FWS	
GETEQUI	NT			NT			
GETINST	(.08,.12)	(.04,.08)	RS	(.08,.13)	(.08,.12)	(NS)	
GIVINST	NT			NT			
HISTGOV	NT			NT			
INDSOLU	NT			NT			
INFGATH	NT			NT			
INITIAT	NT			(.02,.05)	(.06,.10)	FWS	
INQUIRY	NT			(.08,.12)	(.08,.12)	(NS)	
INTRUPT	(.09,.13)	(.19,.25)	FWS	(.12,.17)	(.22,.28)	FWS	FWS
LANGART	(.02,.05)	(.26,.33)	FWS	(.02,.05)	(.26,.32)	FWS	FWS
LISTENG	(.30,.36)	(.31,.39)	(NS)	(.21,.27)	(.12,.16)	RS	
MATHEMA	(.02,.04)	(.10,.15)	FWS	(.00,.02)	(.22,.28)	FWS	FWS
MEDIATC	(.12,.17)	(.01,.04)	RS	(.18,.25)	0	RS	RS
NONE	NT			NT			
NONPART	NT			NT			
OBSERVG	NT			NT			
ORALSCH	(.01,.03)	(.33,.41)	FWS	(.01,.02)	(.34,.41)	FWS	FWS
ORALSOC	(.14,.19)	(.10,.15)	(NS)	(.06,.10)	(.08,.12)	(NS)	
ORALWRK	(.20,.25)	(.09,.14)	RS	(.33,.41)	(.00,.01)	RS	RS
OTHER	(.05,.09)	(.03,.06)	(NS)	NT			

Table 9 (Cont'd)

Variable Code	Fall Observations RS	Fall Observations FWS	Fall Observations Where More Common	Spring Observations RS	Spring Observations FWS	Spring Observations Where More Common	Spring Observations Consistently More Common
Activities: (Cont'd)							
PERFART	NT			NT			
PHYSSCI	NT			NT			
POSSOPP	NT			NT			
PREPARA	(.09,.13)	(.03,.06)	RS	NT			
PRJOBSK	(.15,.20)	0	RS	(.36,.43)	0	RS	RS
PROBLID	NT			NT			
PROJDEC	(.06,.09)	(.17,.23)	FWS	(.13,.18)	(.02,.05)	RS	
PUTAWAY	NT			NT			
RECACTI	NT			NT			
REPORTG	(.03,.05)	(.09,.13)	FWS	NT			
RESISTN	NT			NT			
REVIEWG	NT			NT			
RSPONSB	NT			(.06,.10)	(.02,.05)	RS	
SHAKNOW	NT			NT			
SOCSCI	NT			(.03,.06)	(.08,.12)	FWS	
SUPRAPL	NT			NT			
TAKNOTE	NT			NT			
USEKNOW	NT			NT			
VALUESY	NT			NT			
WRITING	NT			(.01,.02)	(.11,.16)	FWS	

Notes: * See text for explanation.

α For definition of acronyms see Appendix C.

β Not tested since overall time in this category was under 5%.

γ This acronym applies only to resource sites.

δ This acronym applies only to Far West School.

(NS) Not significant. The two confidence intervals overlap.

The balance of consistent differences between sites is to be found among student activity codes. Activities related to the language arts and to mathematics represent a greater share of school time than resource site time, as we would expect, as do discussions related to school or school activities. Interruptions are also more common at FWS than at resource sites. Verbalizations related to resource site work activities are, as one would expect, more frequently found at the resource sites, as are student activities in practicing or being instructed in practical job skills. Student activities relating to mass media (radio, TV, etc.) are also more common at resource sites.

Apart from these consistent differences, all other differences were either inconsistent, failed to attain significance, or else represented times of inadequate magnitude to test.

CHAPTER 5

SUMMARY AND CONCLUSIONS

The ETS evaluation of Experience-Based Career Education (EBCE) at Far West Laboratory (FWL) incorporated plans for a set of behavioral observations, to be taken at two points in time (Fall 1974 and Spring 1975), at two kinds of sites (resource sites and Far West School), on 20 students selected by probabilistic methods from the EBCE students at FWS. Attrition resulted in 60 completed observations which were the subject of this report.

Observational data suggest that resource sites are diversified in kind and that students are generally to be observed in different resource sites at different points in time. The activities in which students engage at resource sites tend to go beyond the normal activities which might be encountered in a traditional classroom, and such activities frequently involve real-world problem-solving situations. Examples would include dealing with problems of metropolitan city management and "hands-on" dealing with retarded, disturbed, and handicapped young children.

The range of career exposures afforded students by FWL EBCE activities tended to be middle-income, urban careers which required little physical work or manual skill. Rural and skilled trades careers were not represented in the sample. There was some suggestion that resource sites embodied more exotic career areas than would normally be encountered by students--nuclear physicist, television dancer, and radio disc jockey are examples.

The behavior of students at resource sites did not exhibit behavior problems to any significant degree--out of 30 observations at resource sites only four presented problems and these were minor or insignificant. More tyically, students exhibited an active participation in the educational processes afforded them through the resource site activities.

Student activities at resource sites, and at Far West School (the site at which EBCE students received the balance of their training), were centered about a series of projects developed by students with the approval of school staff which, when adequately completed, afforded credits toward the completion of the high school program. Students seemed motivated by these credits and on occasion manipulated their activities so as to receive the greatest amount of needed credits for the work done.

At resource sites, the relationships between resource persons and students seemed good, as they did between learning coordinators, other school staff, and students at Far West School (FWS).

At Far West School learning coordinators serve the functions of educational progress monitors and advisors to students. Classrooms are relatively open, and both students and staff seem to enter and exit at will. For example, while one student studied mathematics from a taped program of instruction another student entered, sat down, and began to play guitar. Instruction is highly individualized and presented in group through a tutorial system of instruction.

The high degree of individualization of instruction, the diversity of resource site activities, and the differing progresses of students induce a need for extensive record keeping. This need is met partially through students who serve in clerical capacities, using Far West School as a resource site. The burden of record keeping is extensive and falls upon both students and staff.

Within the scope of the ETS observational evaluation an attempt was made to evaluate eight student outcome objectives of the EBCE program at FWREL: (1) self-understanding, (2) self-reliance and responsibility, (3) oral communications skills, (4) interpersonal skills, (5) problem-solving skills, (6) decision-making skills, (7) skills of inquiry, and (8) career decision-making and planning skills. This attempted evaluation was not generally fruitful owing to the fact that the outcomes were not stated behaviorally, and to the fact that most observations resulted in data which were oblique to the intent of the outcome objectives. Such results as were obtained tended generally to suggest that student behaviors were in keeping with the desired outcomes.

An analysis of times spent by students at resource sites and at FWS was conducted despite the fact that observational times were not randomly selected (a fact which may invalidate the findings). Ignoring methodological difficulties in the analysis, the results indicated a surprising lack of difference between the activities which students engaged in between the two sites. Lessons in English and talk about school activities (for example) were more frequent at FWS than at resource sites and practical job skills and work-related discussions were more frequent at resource sites. Apart from such overtly expectable differences, the times which students spent in various activities at the two different kinds of sites were highly similar.

The fact that observations were conducted at two points in time enabled a comparison of student activities between the Fall and Spring observation periods. Ignoring methodological difficulties, three spheres of behavioral change were found. First, there were changes in subject matter areas in which students engaged. Second, there were modifications in instructional procedures, including declines in the use of textbooks, increases in the use of workbooks, increases in student involvement in instructional groups, increases in writing activities, and decreases in the assignment of new tasks for students. Third, and perhaps most important, there were changes in student behaviors which were suggestive of increasing student maturation. Students were more attentive and less inclined to socialize. Increases in acceptance of responsibility and in displays of initiative were noted, and students were more likely to grasp the learning opportunities presented them.

Notes and References

1. The acronym "APPLE" decodes as "Anecdotal Processing to Promote the Learning Experience." The system was developed by F. L. Converse and E. K. Converse, School of Education, University of California, Berkeley, CA 94720. Written in COBOL programming language, the APPLE system is readily transported to a number of computers of different model and manufacture.

2. This transcript, as well as the others reported, have been modified from the original in order to promote readability, shorten presentation, and preserve confidentiality of those observed. The substance of observation is not appreciably modified by these changes.

3. F. R. Creech, "A factor analysis of occupational description scales based on Form VI Tinidanian males," Educational Testing Service, Princeton, NJ, May 1974.

4. The complete statement of student outcome objectives appears in Appendix B.

5. Appendix B, p. B-1.

6. Miller, G. A., et al., Plans and the Structure of Behavior, Holt, Rinehart and Winston, New York, 1960.

7. Kinkade, Robert G. (Ed.), Thesaurus of Psychological Index Terms, American Psychological Association, Washington, D.C., 1974.

8. Hays, William L., Statistics for Psychologists, Holt, Rinehart and Winston, New York, 1963, p. 291.

9. Clopper, C. J. and Pearson, E. S., "The use of confidence of fiducial limits illustrated in the case of the binomial," Biometrika, Vol. 26, 1934, pp. 404-413.

   See also:

   Creech, F. R. and Grandy, J., "Tables of exact confidence intervals for the binomial distribution," SR-73-81, Educational Testing Service, Princeton, NJ, 1973.

Appendix A

Reliability and Validity of the Behavioral Observation System

The observation system which ETS used for this project required a substantial period of evolution to bring about the form of observation finally employed. During and after this process a number of attempts were made to establish the reliability and validity of the system. The nature of the substudies conducted for this purpose is the subject of this appendix.

The observational system had its origin in the training of experienced observers (excepting only one who was inexperienced) to record the behaviors of volunteer EBCE students and other persons in simulated situations. Observers were familiarized with the goals of the EBCE efforts at four regional education laboratories, one of which was Far West Regional Educational Laboratory. Observers were instructed to be especially attentive to those events and behaviors which related to expressed goals. The written records produced by the observers were subjectively compared and evaluated for consistency, accuracy, and completeness. Deviations from the form and content desired were pointed out to the observers in debriefings in order to optimize observational quality. When it was considered that the observers were sufficiently well trained the first observations were taken.

These observations, the Fall 1974 sequence, were taken at three EBCE sites, including Far West. The returned observations were passed to coders who were responsible for coding and Lexicon development. As coders encountered new phenomena, additional descriptors were added to the Lexicon and earlier coded observations were inspected to assure an accurate coding. The Fall sequence of observations, over the three participating sites, yielded 1,074 events and 5,586 minutes of observational time. This adequately stabilized the contents of the Lexicon and the first reliability-validity evaluations were conducted.

To check the consistency with which both coders and observers were interpreting the contents of the observer's written record two rating-scale documents were employed: "Observation Summary Record: EBCE Learning Center Placements," and "Observation and Interview Summary Record: EBCE Resource Site Placements." Each of these rating forms asked for information related to EBCE goals, and asked for this information in two forms: whether the goal-related behavior was seen during the observation, and if so, to indicate the intensity of the behavior, or the degree to which the behavior was seen as goal-appropriate. A total of 19 resource site observations and 17 learning center observations were rated independently, by both the observer and a coder. The resource site observations, across the 68 comparable items of the rating form,

resulted in 63% agreement between coder and observer. Intensity measurements were made on 4-point scales. If observer and coder may be considered to be in basic agreement when their indicated intensities differ by not more than one point, the degree of agreement would become 88%. Sixty-four items on the learning center rating form were comparable, and resulted in 59% exact agreement, or 82% when observer and coder differed on the intensity items by not more than one point. These were taken as representing reasonable levels of agreement between observer and coder.

Intercoder reliability was developed from a set of 34 observations, selected in roughly equal numbers from the three EBCE sites in the Fall observational sequence. Each of these observations were separately and independently coded by two different coders; all coders were paired in all possible pairs for this purpose. Coders coded these observations as they would any other and the results were compared. The comparisons involved methodological difficulties since the flow of events which comprise an observation do not naturally occur in discrete steps; thus, there was room for debate regarding when an event began and another ended. The differing perceptions of different coders also resulted in unequal numbers of events. As regards the purposes of the project such differences were considered to be of little importance, but matching of events was necessary in order to assess the reliability of the coders.

The most frequent finding was that the events on one coding of an observation were matched by the other. When discrepancies did occur an attempt was made to match the events by relying upon observational content. A total of 20 events could not be matched, leaving a balance of 259 events for which the Lexicon codes could be compared.

Since coders were not constrained to use a given number of ACTIVITY codes in their coding operations, it frequently occurred that the two coders would use a different number of codes to describe the activities of the same event. In order to stabilize this problem separate tallies were maintained for each possible number of descriptive codes which the two coders might use. One coder might use 3 codes, for example, while the other might use 4. This would designate the "3-4 category" and within such a situation the maximum number of agreements between the coders would be 3--this would happen if the 4 words of one coder contained the 3 words used by the other. It was decided to index the degree of agreement between the two coders by computing the proportion of maximum possible agreement in each category. The mathematical expectation of this proportion can be computed under null conditions (assuming only random agreement

between coders) by using the hypergeometric probability distribution, and the fact that the Lexicon contained 95 ACTIVITY codes. The following example illustrates the process:

Category 3-4

No. of Agreements	Prop. of Max. Possible	Hypergeometric Probability
0	0	.88
1	1/3	.12
2	2/3	.00
3	1	.00

Expectation: (0x.88) + (1/3x.12) + (2/3x.00) + (1x.00) = .04.

The results obtained and the expectations of these results under null conditions are displayed in Table A-1. The mean (over all categories) proportion of maximum possible agreements ranged from .20 to 1.00 across the 34 observations. The distribution of the mean proportion of maximum possible agreements had an average value of .70 and a standard deviation of .17. The mean degree of agreement for the 1-1, 2-2, 3-3, and 4-4 categories of the ACTIVITY codes was .68. Fifty percent of all events fell into these four categories. Coders used only one PERSON, CONTEXT, and TOOL code in describing each event. These codes were directly comparable between coders and resulted in 79% agreement on each type of code.

It can be argued, of course, that the Lexicon ACTIVITY codes did not have equal probabilities, and that the hypergeometric probabilities might therefore be misleading. This possibility was not explored. It is doubtful that such exploration would contradict these results; namely, that while intercoder reliability was not perfect, it was nonetheless well above chance expectations.

While evaluations of observer-coder consistency and coder-coder consistency suggested reasonable levels of reliability, several faults were discovered in the course of exploration. These included the facts that: (a) coders were trained during the early course of coding and early observations might therefore be coded with greater error than others; (b) Lexicon code words, developed largely during the early coding experience, might benefit by review; (c) observer-specific observation patterns were detected which, it was felt, could be eliminated by

Table A-1

Distributions of Events, Proportions of Maximum Possible

Agreement, and Expectations of Proportions

Category	Percent Distribution of Events	Proportion of Maximum Possible Agreement	Expected Proportion Under Null Conditions
1-1	12%	.78	.01
1-2	11	.68	.02
1-3	5	.85	.03
1-4	-	-	.04
2-2	11	.67	.02
2-3	16	.69	.03
2-4	6	.78	.04
3-3	9	.60	.03
3-4	11	.69	.04
4-4	18	.67	.04
Total	99%	Mean .74	Mean .03

additional training. It was also felt desirable to obtain some form of overall statement of the observation system's reliability.

In response to these considerations the Lexicon was extensively revised, in collaboration with Far West Laboratory staff, and all observations were recoded by a single coder. Observers were retrained and the second (Spring) set of observations were conducted, this time at only one site--Far West. Three of the observations were simultaneously observed and videotaped. The resulting videotapes were viewed by two observers who independently "observed" the student. The nine observations, taken by three observers on three students, were coded by the (single) coder for comparison.

The observational flow of these nine observations is depicted schematically in Figures A-1 through A-3. The Lexicon ACTIVITY codes developed by the coder for each event are provided and successive events are demarcated by horizontal lines within each observer. It can be noted that the durations of observations are generally similar, the exception being found on Figure A-1 where the live observer started the observation about five minutes before Observer C and about one minute before Observer A, and continued the observation for a longer duration than either of the videotape observers.

There is some suggestion that the two videotaped observations are more similar to each other than is the live observation to either of them. This would be anticipated since the videotape observers have the same viewpoint toward the target student while that of the live observer is different.

Three disagreements were noted in the PERSON codes assigned to the nine observations. One disagreement was found in a videotaped observation and probably represents a coding error since the observer's record is consistent with other observations of the same student. The two remaining discrepancies are located in the first two events of Observer B on Student No. 4. (Figure A-1) and probably are due to the early beginning point of the observer's record. We therefore count one disagreement over the 42 events of the nine observations to obtain a PERSON coding error rate of about 2%.

TOOL codes were generally similar among observers as well, possibly due to the large number of events for which no tool was used. Student No. 7 was assigned PROJPAPR codes by the live observer in the first and fourth events while the videotape observers indicated

Figure A-1

Spring School Site Observations on Student No. 4

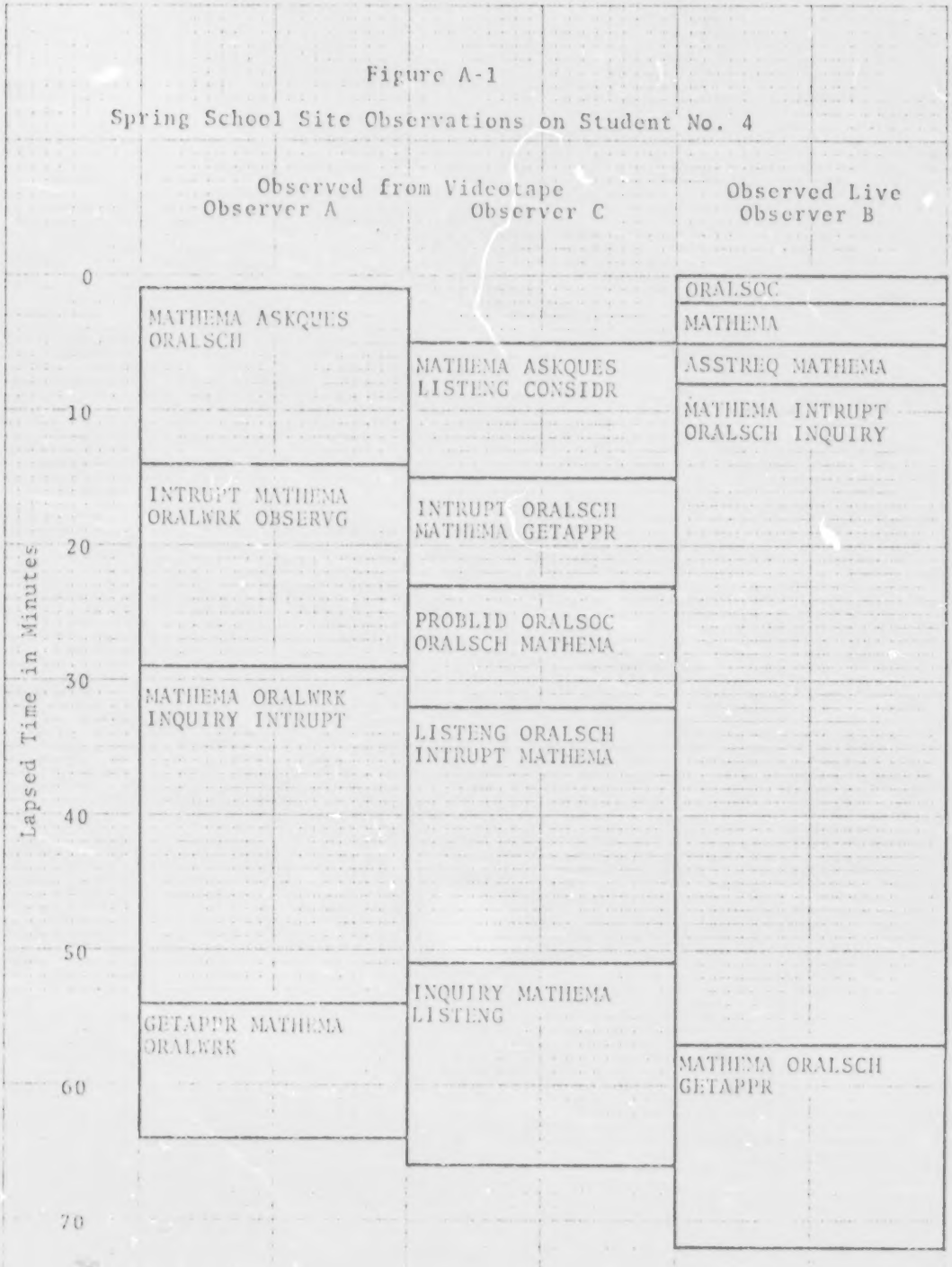


Figure A-2

Spring School Site Observations on Student No. 7

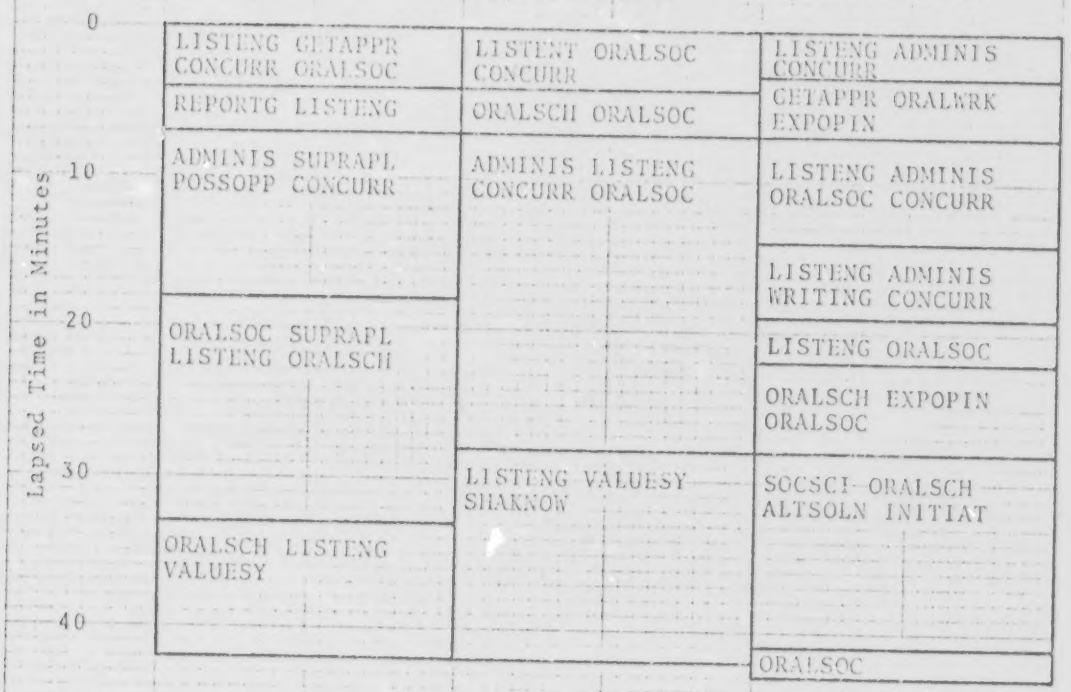
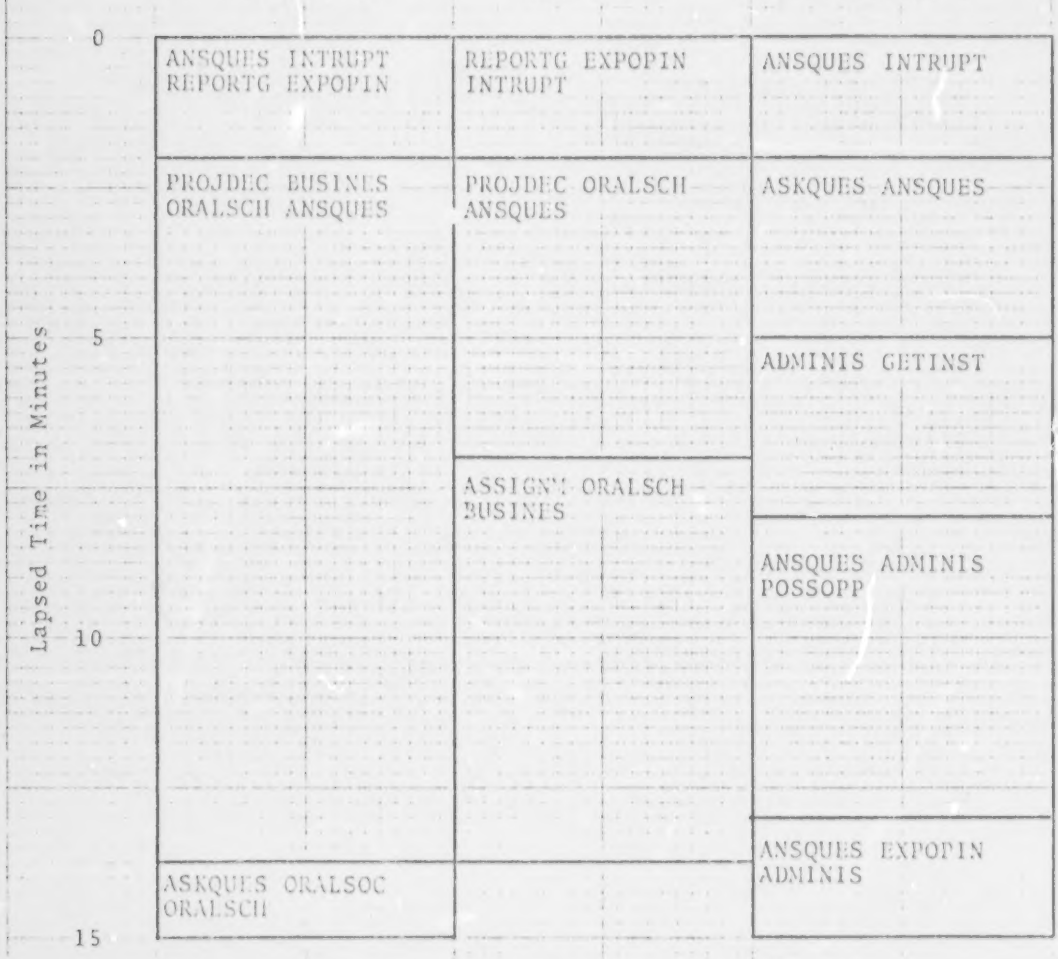


Figure A-3

Spring School Site Observations on Student No. 17



that no tool was used. Student No. 4 provided more complicated discrepancies. Both videotape observers consistently indicated the student as using a textbook, while the live observer indicated a workbook. Student 17 produced no discrepancies in TOOL codes and was indicated by all observers as using no tools.

CONTEXT codes demonstrate a general attribute of the Lexicon codes, namely, that the words are semantically related. The CONTEXT code used for 10 of the 14 events of Student No. 4 was "COMBINTN," indicating that the student was emitting and receiving input related to the task at hand. Exceptions are a "WORKING" context for the third event of Observer A, and EXCHANGE, WORKING, and INSTRUCT codes for the first three events of the live observers. The first three events of the live observer span the same time frame as do the first events of the two videotape observers and the combination of the live observer's CONTEXT codes (EXCHANGE + WORKING + INSTRUCT) would roughly equal a COMBINTN code, the code used by both of the videotape observers for the first event of their records. The WORKING context provided in the third event of Observer A is likely an error since the ACTIVITY codes include ORALWRK and INQUIRY, suggesting that the student was both emitting and receiving information related to the task at hand--a situation appropriately described by a COMBINTN CONTEXT code.

We interpret the EXCHANGE, WORKING, and INSTRUCT CONTEXTS provided by the live observer as being consistent with the COMBINTN codes used by the videotape observers during the same time frame, we regard the WORKING CONTEXT code of Observer A as an error, and we evaluate the consistency of the system by combining the first three events of the live observer under a COMBINTN code. Thus one error is defined over 12 events.

The CONTEXT codes provided by each observer for each event of Student No. 7 are shown in Figure A-4, and may be inserted into the event time frames of A-2 to establish their comparability. The "WORKING" code of Observer B is likely an error, but other code differences could possibly accrue to variations in event length and the fact that only one CONTEXT code can be used with any given event. There seems to be no good way to score such perturbations so that, rather arbitrarily, three errors were defined over the 17 events of Figure A-2.

The CONTEXT codes for Figure A-3 were all COMBINTN codes except the fourth event of the live observer. The INSTRUCT code used there is reasonable but owing to the fact of a disagreement one error was defined.

Figure A-4

CONTEXT Codes for Student No. 7

Videotape Observations		Live Observation
Observer C	Observer B	Observer A
INSTRUCT	INSTRUCT	INSTRUCT
COMBINTN	WORKING	COMBINTN
INSTRUCT	INSTRUCT	INSTRUCT
RECEIVNG	COMBINTN	INSTRUCT
COMBINTN		RECEIVNG
		COMBINTN
		COMBINTN
		TRANSITN

Assembling the CONTEXT errors over the nine observations therefore results in five errors over 42 events, or an "error rate" of 12%.

The greatest difficulty of evaluation comes in the attempt to evaluate the consistency of ACTIVITY codes which were presented in Figures A-1 through A-3. A total of 30 distinct ACTIVITY codes were applied to the events in the nine observations. The test applied to these 30 codes attempted to determine whether, when one observer's record produced a given code, other observers' records would produce the same or a similar code during the same time frame.

The application of this test required that each ACTIVITY code in a reference event be compared with the activity codes in other observers' events, where the other observers' events overlapped, by at least one minute, the time span of the reference event. Of course, the referencing of one videotape observer against the other represents an arbitrary reference so that their results were combined. Three types of evaluations were conducted. In the first type a reference videotaped observation was compared to the remaining videotape observation and the live observation. Results for each of the two reference videotaped observations were then combined. In the second type of analysis the live observation was compared against both videotaped observations. In the third type the two videotaped observations were each compared against the other and the results combined.

In comparing ACTIVITY codes three results were possible: hits (i.e., identical ACTIVITY codes were found in two observations), similar codes (i.e., those of similar semantic import), and misses (i.e., no code was identical or similar to the reference code).

The results of these evaluations are displayed in Table A-2. The similarity of the pairs of videotaped observations is reflected in the 63% agreement between codes used in the two observations, and is contrasted with the 48% agreement found when comparing the live observation with those which were videotaped. The relatively high degree of agreement between videotaped observers suggests that there is some consistency between the things seen by two observers having the same viewpoint. This is a statement of observational validity. The somewhat lower consistency found between the live observer and the videotaped observers suggests that the viewpoint of the observer makes some difference.

Recall of events by the APPLE system depends upon assembling logical sequences of code words related to the

Table A-2

ACTIVITY Code Comparisons Among Observations

Comparison	Results		
	Misses	Similarities	Hits
Video. vs. (Video. + Live)	28%	19%	53%
Live vs. Videotaped	35	17	48
Video. vs. Video.	20	16	63

topic of interest. We note that 20% of the time, when one designated a reference code word in one videotaped observation neither it nor a related word appeared in the other videotaped observation. Eighty percent would therefore seem to be the maximum retrieval efficiency of the APPLE system operating under the current Lexicon, i.e, should one assemble a logical sequence of ACTIVITY codes one would expect to retrieve about 80% of the desired events. This figure corresponds approximately to the experience of researchers who found most of the needed material accurately retrieved by the APPLE system, but who occasionally were required to scan the full set of observations in order to extract relevant material.

In summary, the evaluations conducted on the observational system compared coders' perceptions of the observational report with those of observers through a set of rating forms completed by both observers and coders. Their perceptions agreed exactly on the rating forms about 60% of the time and were quite similar to each other about 85% of the time.

Intercoder reliability was evaluated by comparing the codes produced by pairs of coders who coded the same observations. PERSON, CONTEXT, and TOOL codes agreed 79% of the time between pairs of coders. Differing numbers of ACTIVITY codes were assigned by the pairs of coders in about half of all events. When the same number of ACTIVITY codes were assigned by the two coders the codes agreed about 68% of the time. The same figure, including situations in which the two coders assigned differing numbers of ACTIVITY codes, was 74%. Under conditions of random assignment of ACTIVITY codes to events only 3% matches would be expected.

The evaluation of the observational system as a whole was conducted by comparing three observers, each of whom observed three students. Each student was observed by a live observer and by two observers who saw a videotape. The Lexicon codes obtained from these nine observations were compared in order to ascertain the quality of the end product of observation when some control was placed upon conditions of observation. PERSON codes were accurate about 98% of the time; CONTEXT codes, about 88% of the time; and TOOL codes were free of discrepancies between the two videotaped observers. However, videotaped TOOL code results differed widely from the live observer who considered the students to have used a workbook instead of the textbook indicated by the videotape observers. ACTIVITY codes agreed between the two videotaped observers about 63% of the time and were similar about 79% of the time. The live observer results agreed with

those of the videotaped observers about 48% of the time and were similar about 65% of the time. Retrieval efficiency of the APPLE system within the constraints of the current Lexicon was estimated at approximately 80%; high enough to be of great utility, but not perfect.

Appendix B

Student Outcome Objectives at Far West School

STUDENT OUTCOME OBJECTIVES

The objectives presented below are statements of what FWS graduates will know or be able to do. They are organized into three broad categories: career development, basic skills, and life skills--each with two or more subheadings. The specific objectives under each subheading are shown in order of priority.

Core Student Outcome Objectives

Career Development Objectives

Self-Development

1. The student will demonstrate awareness and understanding of his (or her) own current interests, abilities, values, and limitations relevant to career goal selection and achievement, and recognize that these may change with further education or experience.

2. The student will demonstrate self-reliance and ability to function responsibly and independently in daily activities; i.e., he will be able to plan activities and manage time and other resources to accomplish goals, keep commitments to others, follow through on planned activities seeking guidance or assistance as necessary, evaluate his own behavior and performance, and accept responsibility for actions taken.

Career Decision Making and Planning

1. The student will have a positive attitude toward planning his future education, career(s), and lifestyle.

2. The student will have integrated (related) information about occupations with information about self.

3. The student will have located and used information about occupations.

4. The student will know some of the factors associated with selected occupations that contribute to job success and job satisfaction.

5. The student will have obtained employment information, completed job applications, taken interviews, written letters of application, prepared a resume.

6. The student will have demonstrated that he has made an informed decision regarding his post-high school educational/vocational plans.

7. Those students who have tentatively selected a career area will have begun to acquire some of the related job-entry skills and experience.

8. The student will know the functions, characteristics and requirements of a broad range of self-selected occupations.

Basic Skills Objectives *(To be demonstrated when in appropriate situations requiring the use of the skill.)*

Oral Communications

1. The student will communicate facts, ideas, and feelings in a manner that is effective and appropriate to various situations (social, school, or work).

2. The student will listen effectively.

Writing Skills

1. The student will communicate facts, ideas, and feelings in writing so that most people can understand what was stated.

2. The student will write letters, descriptions, and reports required in daily life.

3. The student will demonstrate performance of writing skills necessary for his chosen career or continued education.

Reading Skills

1. The student will read selections from a newspaper or other popular periodical and (a) recognize the main point(s), (b) recognize the author's purpose, and (c) locate specific facts and details.

2. The student will read and comprehend materials pertaining to his areas of career involvement, such as instructions, manuals, forms, parts lists, and technical articles.

3. The student will read and comprehend materials appropriate to his vocational and recreational interests.

4. The student will read selections required for educational or occupational advancement and (a) define the author's purpose and support that definition with evidence, (b) identify and explain different levels of meaning included in the selection, (c) identify biases with supporting evidence, (d) extend interpretation beyond the printed information, and (e) recognize and describe different writing styles.

Basic Quantitative Skills

1. The student will perform arithmetic operations necessary for successful daily living, such as (a) making and receiving change, (b) budgeting, (c) banking, (d) completing tax forms, (e) doing comparison shopping, and (f) generally dealing with weights, measures, calendars, clocks.

2. The student will comprehend and interpret information presented numerically and graphically as found in such media as newspapers and weekly news magazines.

3. The student will perform mathematical operations necessary for his chosen career or continued education.

Life Skills Objectives *(To be demonstrated when in appropriate situations requiring the use of skills.)*

Interpersonal Skills

1. The student will effectively participate in peer and adult interactions based on understanding of roles and obligations, respect for individual rights and perceptions, and ability to contribute to the resolution of conflicts resulting from differing personal needs and values.

2. The student will cooperate with others as a means of attaining goals.

Problem-Solving Skills

1. The student will define a problem by identifying a need or a discrepancy between what is and what he thinks should be. This can be in a personal, group, societal, academic, or career situation.

2. The student will use a variety of sources and techniques of data gathering.

3. The student will propose or generate alternative solutions, anticipate consequences of various solutions, choose or combine solutions, and implement a chosen course of action.

Decision-Making Skills

1. The student will recognize decisions that need to be made, including when they must be made.

2. The student will identify alternative choices or options and their probable outcomes.

3. The student will identify personal values and goals which relate to the decision being made.

4. The student will choose the alternative that fits best with personal values and goals.

5. The student will accept responsibility for his decision.

Inquiry Skills

1. The student will develop and expand his skills of inquiry and critical thinking including such functions as classifying, comparing/contrasting, defining, interpreting, generalizing, inferring, hypothesizing, predicting, analyzing, synthesizing, and evaluating events and written or spoken material.

Elective Student Outcomes

The objectives above define the core curriculum of the FWL EBCE program. These are areas in which student achievement of knowledge, skills, and experience are deemed essential. The Far West School instructional system also provides learning opportunities in other areas desired by the student, his parents, employers, or higher education institutions. But these are areas where growth may occur at any time if the student has acquired the basic core knowledge and skills essential to independent learning and adult living. These other curriculum areas are thus elective for individual students depending on their interests, goals, abilities, previous education and experience, and needs to meet Oakland Public Schools or college entrance requirements.

Elective Life Skills Objectives

Media Skills. The student will communicate or understand ideas or feelings expressed through media other than written or spoken words.

Physical Fitness and Health. The student will develop the knowledge and skills necessary to maintain good health and physical fitness.

Social and Cultural Awareness. The student will understand his social and cultural heritage as a means for understanding himself and his physical and social environment.

Political Awareness. The student will understand the basic workings of politics and government and the effect of governmental policies and activities on his daily life, and learn to effectively use his resources as a citizen to influence governmental action.

Appendix C

Lexicon of Code Words

EBCE Observation Lexicon

CONTEXTS

Computer Name	Word Concept	Definition
COMBINTN	Combination	Student is both putting out and receiving input related to school or work task on hand.
EXCHANGE	Exchange	Student is both putting out and receiving input - not related to subject at hand or in cases where the task cannot be identified.
INSTRUCT	Instruction	Student is being instructed, receiving input, related to subject/task at hand.
PRODUCNG	Producing	Student is working (putting out); output is not related to task at hand, or the task cannot be identified.
RECEIVNG	Receiving	Student is receiving input not related to task at hand (also used when task cannot be identified.
TRANSITN	Transition	No visible or discernible input or output on the part of the student.
WORKING	Working	Student is working (putting out) related to subject/task at hand.

EBCE Observation Lexicon

PERSONS

Computer Name	Word Concept	Definition
ADULTGRP	Adult group	Situation involves student and group of adults (LC's, RP's, public, etc.).
ALONE	Alone	Situation involves student exclusively, though others may be in the vicinity.
FLLWWORK	Fellow workers	Situation involves student and employee(s) at the job site (other than RP).
LEARNCOR	Learning Coordinator (LC)	Situation involves student and his learning coordinator (LC).
LEARNGRP	Learning group	Situation involves group composed of student peers, and LC, RP, or tutor.
OTHSTAFF	Other staff	Situation involves student and staff at learning center other than student's LC.
PEER	Peer	Situation involves student and a peer (fellow FWS student).
PEERGROU	Peer group	Situation involves student and group of fellow students (peers).
PUBLIC	Public	Situation involves student and public (i.e., clients, observers, etc.).
RESPERSN	Resource person (RP)	Situation involves student and resource person (RP).
STAFFPBL	Staff and public	Situation involves group composed of student job site staff and clients.
TUTOR	Tutor	Situation involves student and tutor.

EBCE Observation Lexicon

MATERIALS

Computer Name	Word Concept	Definition
ARTMATER	Art materials	Art materials, including paint, etc.
LABEQUIP	Lab equipment	Laboratory equipment, test tubes, etc.
MAPGRAPH	Maps and graphs	Maps, graphs, charts, etc.
MEDITOOL	Medical tools	Medical equipment, stethoscope, etc.
NA	Not applicable	No tool used.
PHTOTOOL	Photography equipment	Photographic equipment, camera, darkroom tools, etc.
PROJPAPR	Project papers	Papers, documents, forms required by FWS or individual projects.
REFNBOOK	Reference books	Reference books, i.e., dictionary, encyclopedia, etc.
TESTEQUI	Test equipment	Scale models, equipment used for research purposes.
TEXTBOOK	Textbook	Text or school book.
VSUALAID	Audio-visual aids	Audio visual aids, including tapes, slides, films, etc.
WORKBOOK	Workbook	Workbook, textbook, accompaniment.
WORKPAPR	Work paper	Miscellaneous workpapers, index cards, notes, etc.

EBCE Observation Lexicon

ACTIVITIES

Computer Name	Word Concept	Definition
ADMINIS	Administration	Taking care of administrative details at job site or learning center; managing; includes, for example, student introducing observer to RP and discussions about learning center forms.
ADVISNG	Advising	Student offering advice and or influencing decisions to be made.
ALTSOLU	Alternative solutions	Student explores or shows awareness of alternative solutions to a problem, or he is exposed to alternative solutions as a specific problem solving technique.
ANSQUES	Answer question	Student makes a direct reply to a simple question.
ASKQUES	Ask question	Student asks a direct and simple question.
ASSIGNM	Assignment	Getting an assignment of work to be accomplished in the relatively near future.
ASSISTG	Assisting	Student helps someone else at a task.
ASSTREQ	Assistance request	Student requests assistance from another person.
ASSTWAI	Waiting for assistance	Student waits (doing nothing else) for assistance he/she has requested.
BIOSCI	Biological sciences	A subject area comprised of the biological sciences (includes medicine, zoology, etc.).
BLENDNG	Blending	Exposure or learning of academic subject matter in "real world" (i.e., job site).
BUSINES	Business and economics	A subject area comprised of business and economics.

ACTIVITIES (Cont'd)

Computer Name	Word Concept	Definition
CAREER	Career	Student seeks or is given career information of some kind (includes general information about completing job applications, etc.); also student expressing an opinion about a career or employment.
CONCURR	Concurrent activity	Student is doing two things at once; for example, filling out a form while listening to a conversation.
CONSIDR	Consideration	Consideration, tact displayed by student.
CORRELA	Correlation	Correlating information; relating past experiences or knowledge to situation or idea at hand; generalizing and synthesizing.
EXPOPIN	Express opinion	Student expresses an opinion of any kind; i.e., "I like...," "I don't like...," "I think...," "I feel...," etc.
FLYING	Flying	Anything to do with flying an airplane - technical details, how to, etc.
FUTPLAN	Future planning	Planning for future activities in project or work, which will be accomplished at some unspecified future time.
GETAPPR	Getting approval	Student receiving praise or approval for something he/she has done.
GETEQUI	Getting equipment	Student getting needed equipment for on-going activity or activity about to begin; can be voluntary or on request.
GETINST	Getting instructions	Student gets instructions for doing task at hand.
GIVINST	Giving instructions	Student gives instructions, on own initiative or as a function of on-going activities.

ACTIVITIES (Cont'd)

Computer Name	Word Concept	Definition
HISTGOV	History/Government	A subject area comprised of history, government, political science.
INDSOLU	Independent solution	Student solves problem independently, without help.
INFGATH	Information gathering	Being exposed to or using information gathering skills or techniques to obtain desired knowledge; includes awareness of sources of information.
INITIAT	Initiative	Student displays initiative; especially a willingness to make the most of learning opportunities.
INTRUPT	Interruption	On-going activities are interrupted for a short duration; includes student leaving the observation setting for a few minutes.
INQUIRY	Inquiry	Student asks questions to gain knowledge; connotes an investigation of the learning experience at hand.
LANGART	Language arts	Subject area including all languages - grammar, literature - and activities connected with the language arts (i.e., reading, etc.).
LISTENG	Listening	Student listens, usually to someone else talking.
MATHEMA	Mathematics	Subject area of mathematics.
MEDIATC	Media technique	Student learns or is exposed to the techniques and uses of mass media (i.e., radio, advertising, TV, etc.), and/or to the uses and methods of relating to the public on a one-to-one basis (interviewing, etc.).
NONPART	Nonperforming arts	Subject area and related activities encompassing the nonperforming arts (i.e., painting, photography, etc.).

ACTIVITIES (Cont'd)

Computer Name	Word Concept	Definition
OBSERVG	Observing	Student observes or watches an on-going activity or an object, relevant to the learning process.
ORALSCH	Oral - school	Verbal behavior on the part of the student relating to school or school activities.
ORALSOC	Oral - social	Verbal behavior on the part of the student relating to social activities.
ORALWKK	Oral - work	Verbal behavior on the part of the student related to work (job site activities).
OTHER	Other subject areas	A general classification of unusual subject areas, not subsumed under the specific subject areas (i.e., psychic phenomena, etc.).
PERFART	Performing arts	Subject area and related activities encompassing the performing arts (i.e., dance, theatre, etc.).
PHYSSCI	Physical sciences	Subject area relating to all physical sciences (includes chemistry, physics, etc.).
POSSOPP	Possible opportunity	Possible learning opportunity in the environment, not utilized by student; and/or instructor offers opportunity for student expression of some kind, which is not taken ("bait - no bite").
PREPARA	Preparation	Student prepares himself for upcoming task (includes details such as find the correct page in a book, etc.); doing background work for task, project, etc.
PROJOBSK	Practical job skills	Student being instructed in or utilizing practical job skills relevant to the individual job site experiences.
PROBLID	Problem identification	Student identifies a problem or difficulty in his/her environment.

ACTIVITIES (Cont'd)

Computer Name	Word Concept	Definition
PROJDEC	Project decision	Project decision, planning, discussion, development, awareness, requiring at least a minimun participation from student.
PUTAWAY	Putting away	Putting away materials, cleaning up after work, etc.
RECACTI	Recreational activity	Student engages in some form of recreational activity (can include snacking, reading magazines, etc.).
REPORTG	Reporting	Student makes a report on work accomplished or work to be done; can be voluntary or on request.
RESISTN	Resistance	Student shows resistance or unwillingness to do task at hand.
REVIEWG	Reviewing	Student reviews, goes over work that has been or is to be done; may be done voluntarily or on request.
RSPONSB	Responsibility	Student shows responsibility in work or school by following through on assigned tasks (self-assigned or assigned by others); exhibiting self-reliant behavior.
SHAKNOW	Sharing knowledge	Student shares some previously obtained knowledge with others, from memory, notes, etc.
SOCSCI	Social sciences	Subject area encompassing the social sciences (i.e., psychology, anthropology, etc.).
SUPRAPL	Supervision applied	Student behavior provokes adult supervision; does not have to be a direct reprimand, may be more subtle.
TAKNOTE	Taking notes	Student takes notes for future reference.
USEKNOW	Using knowledge	Student uses previously obtained knowledge in performance of current task (from memory or other references).